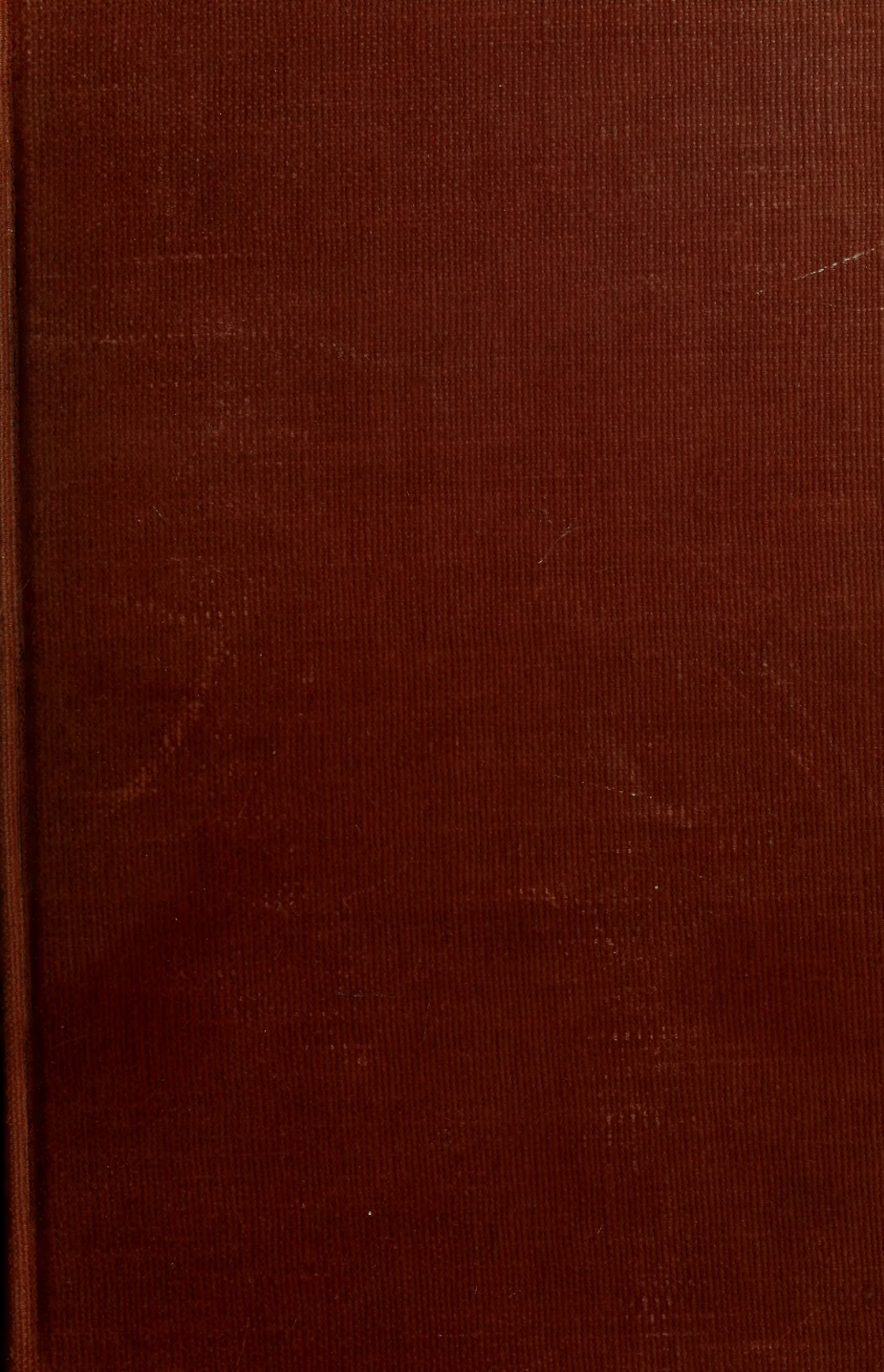
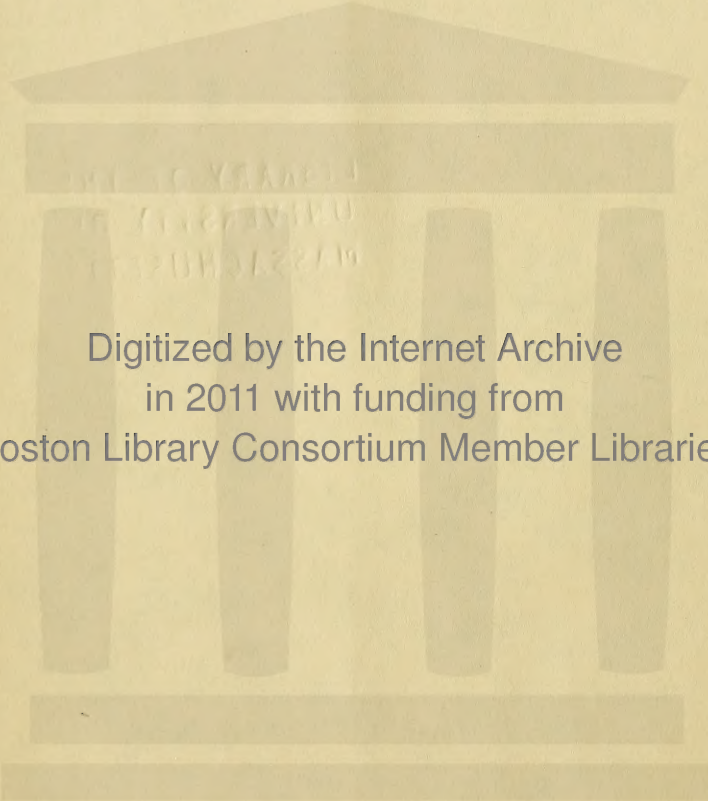






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The University of Massachusetts

REPORT OF THE PRESIDENT

to the Board of Trustees, the Governor, and Citizens
of the Commonwealth

JANUARY, 1948 TO JANUARY, 1949



*The State University
Builds for the Future*

The Honorable Joseph W. Bartlett
Chairman, Board of Trustees
The University of Massachusetts

Sir:

I have the honor to present through you to the Board of Trustees for transmission to the Governor of the Commonwealth the annual report of the University of Massachusetts for the year ending January 1, 1949.

Respectfully submitted,

RALPH A. VAN METER, *President*

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The report of the President for the year ending January 1, 1949, is part of the 86th annual report of the University of Massachusetts, and as such is Part I of Public Document 31. (Section 8, Chapter 75, of the General Laws of Massachusetts.)

The State University Builds for the Future

Report of the President

The most significant development of the past year for the University of Massachusetts has been the continued growth of enrollment and the continued expansion of facilities that are bringing the State university closer to meeting the permanent needs of the people of the Commonwealth.

Since the expansion of the University started in 1946, our central efforts have been directed to the sound planning of classrooms, dormitories and other facilities to meet both the emergency needs of the veterans and the long-range needs of qualified Massachusetts youth for higher education.

During the past year much progress has been made toward our goal of developing a well-balanced university. Notable developments of the year have been the establishment of a School of Engineering and a School of Business Administration, and the completion of the first permanent buildings in our development program.

Our growth in these post-war years has been rapid. Our highest pre-war undergraduate enrollment was 1261 in 1940-41, when we had a total enrollment of 1670. By stretching our facilities to the limit we were able to accommodate a total of 2026 on the Amherst campus in 1946-47.

In September 1948, we had increased to a total of 3245 students at Amherst, plus another 813 at Fort Devens. When the second semester opens in February 1949, we shall have approximately 3400 students on the permanent campus and 600 at Fort Devens. And by next September we shall have 4000 on the Amherst campus—double the enrollment of only three years ago.

This growth is all the more remarkable if it is remembered that in 1946-47, when we had 2026 students, we were stretched to the limit of our facilities. The slow growth of the school and the steady increase in enrollment prior to the war did not keep pace in those years with the increasing demands for

admission. Throughout the 1930's we were forced to turn away many qualified youths who could not afford to attend privately-endowed colleges, or find at them courses available here.

On page 16 of this report is a summary of the new buildings constructed on our campus in the last 20 years. It may be noted that from 1929 to 1946, depression and war years, only five major buildings were completed—two dormitories financed by private funds, one dormitory and a library financed by State and Federal funds, and a physical education building financed by Alumni gifts of \$115,000 and a State appropriation of \$172,500. It is obvious that at this pace facilities could not keep abreast of enrollment pressures from young men and women of this State. The University accepted as many qualified students as its facilities permitted while maintaining the high educational standards to which these youths were entitled.

For 15 years we have had to limit enrollment, more drastically after 1935 than earlier. To a large extent the depression and the war were responsible for the fact that the State did not authorize funds for any major buildings to be built solely with State funds from 1929 to 1946. In these 16 years the State contributed \$431,970 to new major buildings while the Federal government contributed \$172,980 and private funds contributed \$524,600. Not only did our building facilities lag behind enrollment demands, but we were in no position to handle the record enrollments in Massachusetts of the post-war years.

In short, it was inevitable that the tremendous post-war increase in the demand for higher education in 1946 should have found our Commonwealth, like other states, unprepared.

The achievement of handling both the emergency needs of veterans and the neglected needs of Massachusetts youth has been the result of a combined operation—a State, Federal and Alumni building program that began in 1946. Emergency Federal and State buildings, combined with permanent State and Alumni buildings, have made it possible for the University to do the difficult job of meeting the post-war enrollment emergency while building soundly for the future.

Fundamental to the success of this combined operation has been the sustained support of the Legislature since 1946. Without it the University could not have done the job, be-

cause of the years of inadequate development and the size of the undertaking.

In 1946 the Legislature wisely created the temporary branch at Fort Devens and authorized three permanent buildings on the Amherst campus costing a total of more than \$1,500,000. This was the first authorization for major buildings to be erected solely with State funds since the erection of the \$70,000 food technology laboratory in 1929.

Support of the State university in meeting the needs of qualified Massachusetts youth for education within their financial reach has never been a partisan question in our Legislature. In 1946 and 1947 and during the past year, the University has had the full cooperation of both the State Administration and the Legislature. The bi-partisan expansion program was started in 1946. It was continued in 1947 when the Legislature authorized additional permanent buildings and equipment costing \$1,228,500 and voted university status for what was then Massachusetts State College. In 1948 the Legislature authorized \$3,735,500 for new construction, including \$1,361,000 for our central power plant development and \$1,500,000 for self-liquidating housing.

Citizens of Massachusetts have reason to be proud of this bi-partisan support, and the record of the General Court since 1946. The University's growth is now beginning to make up for the understandable neglect of the depression and war years.

In 1948 the Legislature also increased faculty salaries to take care of increased living costs and to prevent loss of the State University teachers to other institutions. To handle the greatly increased teaching loads 58 teachers were added during the past year.

The achievement of meeting the emergency needs of veterans and the neglected needs of Massachusetts youth has not been done without overcrowding of students and overloading of faculty members. A typical example is that two of the dormitories built by the Alumni Building Corporation in 1947 for a normal capacity of 300 students have accommodated 538 men during the past semester. At present 32 married students are living in trailers on the campus. Several more students and faculty families are living in Federal housing at Amherst College through the generosity of our neighboring institution.

During the past year the University has been engaged, as one faculty member remarked recently, in waging an academic battle of the bulge. The bulge is the overcrowding—and it will be a temporary campaign, for we could not operate long under the present crowded conditions in our dining halls, dormitories, classrooms and laboratories. But there is every indication that with continued cooperation of the Legislature the University will be able to complete our post-war development program.

There are strong indications that the University will continue to be taxed to the limit of its facilities for many years. Recently, the American Council on Education reported that while veterans' enrollment in American colleges is 100,000 below last year's enrollment the total college enrollment is up 3.1%. That is, permanent civilian demand has more than replaced the veterans' demand, as was to be expected. There is every reason to expect that future demand will increase steadily as more and more boys and girls from low and moderate income families seek the advantages of higher education.

We have been building for the future in the past few years. We can look forward to the time in about five years when we can assume the full responsibilities of the State university in adequate service to the Commonwealth.

I do not believe that the State's educational needs will absorb an unreasonable proportion of the State's budget. Our operating budget is about 1.5% of the State budget, while comparable figures recently assembled on New England Land-Grant Universities run from 2.2% in Connecticut to 9% in Maine and New Hampshire. Education is not cheap. But in our State, where the skill of its people is its greatest resource, there is no better investment than the education of its youth.

BUILDING PROGRAM

The combined building operation of the State, Federal government and Alumni Building Corporation since 1946 has been an interesting chapter in Massachusetts educational history, and I should like to trace it briefly in this section of my report.

When the great pressure for admission started in 1946, we were given real and almost immediate help by the Federal

government. The Federal Public Housing Authority moved in 18 small surplus dormitory and apartment buildings, and erected them for temporary use. They have been of inestimable value.

These temporary buildings are of light construction and will not last much longer, but they have been used constantly at capacity since they were erected. They are providing living quarters today for 90 veterans' families and 231 single students. We hope we can make them last through another winter.

In 1947, before there was time for the State to build needed classroom buildings, the Federal government came to our assistance again by moving in and erecting four large wooden surplus buildings. One burned before we could move into it. The other three have supplied indispensable classrooms and science laboratories and a temporary dining hall annex. Altogether these Federal buildings were valued at \$600,000.

In 1946 the State authorized three permanent buildings, and the setting up of a temporary branch at Fort Devens to provide the first two years of college training. The permanent buildings were a physics, a home economics and an animal pathology building. Rising construction costs subsequently required the transfer of reserve funds, through the cooperation of the Governor and Council and the Massachusetts Public Building Commission, to provide the needed additional funds.

During the past year we have occupied the \$643,750 home economics building. Not only has this been of vital aid to our School of Home Economics, but it has released room at many points on the campus. The \$518,000 physics building, which was re-authorized along with the animal pathology laboratory in 1947, will be completed next semester, and will be of great help in handling the record enrollment of 4000 in the coming year.

In 1947 the Legislature authorized an engineering laboratory building, Gunness Laboratory. This \$424,000 building was started in April, 1948, and is almost completed. It will provide permanent laboratory space for mechanical engineering. We have already occupied another building, the engineering annex, built under a \$120,000 emergency appropriation made early in 1948 to replace the wooden Federal surplus

building that burned.

In 1947 the State also provided crucial aid to meet the housing emergency. Three cement-block dormitories were authorized costing \$522,000. During the past semester single students have occupied two of them, while the third, an apartment-type building, is now housing 30 student families. Two more such state-financed buildings, authorized in 1948, will be ready in a matter of days. All five of these buildings were made of cement blocks, rather than brick, to save time in construction. When we can eliminate crowding in them, they will be reasonably satisfactory and comfortable.

The alumni contribution to this combined building operation has been made through the non-profit Alumni Building Corporation authorized by the Legislature. In 1946 this agency began work on two self-liquidating dormitories, Chadbourne and Greenough Houses, where 538 men are now housed. Costing \$550,000 these were the third and fourth alumni dormitories to be built since 1939.

Mills House, the fifth of the Alumni Building Corporation's dormitories, was authorized in 1946, and will be ready during the next semester. With the two new cement-block dormitories it will help greatly in relieving the crowding in dormitories for men.

Next summer we shall close the University at Fort Devens and make it possible for these last 600 men to complete their college experience on the established campus in Amherst. To accommodate them, the Alumni Corporation has the foundations built for three more dormitories which we shall need urgently next September.

Two of these are in the area set aside for dormitories for women. We shall use them for men until the largest classes of veterans are graduated, then add them to our housing facilities for women. We have housing on campus for only 400 women students. Sororities and commuters bring the total to about 600—the limit until more living accommodations can be made available for women. The needs of qualified women for low-cost higher education, and the resulting pressure for admission, are even more serious than with men in Massachusetts. We should look forward to a total enrollment of at least 1000 women very soon.

With the completion of the eight dormitories, and a small

faculty apartment building that is urgently needed, the Alumni Building Corporation will have invested a total of \$2,859,600 of private funds on the State university campus since 1939. These buildings will become the property of the State without cost to the taxpayers.

During the past year the State authorized a new power plant and the first half of a main engineering building. Plans have been completed for these projects, along with plans for the animal pathology laboratory and a field station building at Waltham. All are needed by the Commonwealth, and the contracts are expected to be let within the next several weeks.

Since 1946 the State has authorized a total of \$5,143,750 for new buildings to be erected and equipped solely with State funds on the State university campus. This has been the key factor in the combined building operation that has made it possible for the State university to meet the emergency needs of veterans while building for the future needs of the Commonwealth.

BUILDING NEEDS

Students at the University are still in great need of an additional dining hall. We are accommodating about 1400 persons in our dining rooms and that has proved to be the limit. The dining halls have been crowded but we hoped we could accommodate several hundred more students this year by adopting mass feeding methods on trays and by extending the hours. We still serve about 1400 at the dining halls. Students will not crowd in beyond that number, and two thousand students are eating elsewhere.

Fraternities and sororities accommodate 500 or 600. The only visible accommodations for the rest are one small restaurant and two dining cars near the campus. A few go down town—a mile away—especially for dinner in the evening, but hundreds of students skip meals or try to board themselves. The situation is undesirable, and dangerous from a health standpoint. That is why we asked last year, and are asking again this year, for a new dining hall large enough to accommodate at least 1000 students.

With one new engineering laboratory in use and another nearly finished we still have an acute problem in providing classrooms and laboratories for that school. The engineering departments here have grown very rapidly and now have an

enrollment of 405 students on the Amherst campus alone. The fire of last January destroyed 22,000 square feet of floor space for engineering and \$100,000 worth of equipment, interfering seriously with our laboratory program in electrical engineering.

The Engineering Shop, built in 1916 for instruction in agricultural engineering, has been crowded to include laboratory work in electrical machinery and materials testing. At times there are 8 classes in session in the shop at once. Engineering classes are now conducted in 14 buildings on the campus.

The first half of the main engineering building authorized in 1948 will be largely devoted to electrical engineering and metallurgical laboratories. We are asking for the second half of this building in the present budget to provide class and drafting rooms and four additional engineering laboratories. These are necessary to a minimum program and are not provided for in other units.

The expansion in enrollment during the past year has been largely at the junior-senior level as students were transferred from Fort Devens to Amherst. We have absorbed them for the most part into courses already established and it has not been necessary to set up many highly specialized laboratories like those in engineering.

Rather, the problem has been one of providing dormitory space, and general classrooms and teachers for more students. Throughout the period we have held freshman enrollments to about 400 each year. The expansion in freshman and sophomore facilities has been taken care of at Fort Devens.

As the veterans are graduated, we can increase our freshman-sophomore numbers to bring the four classes into balance. In two years we should be ready to admit 800 freshmen. Most of the problems involved will merge with the general problem of providing classroom space; but where laboratories are involved for large numbers of freshman and sophomore students, we must build again for specific purposes.

All students must take certain courses in science. That is why we are asking for funds this year to double the size of the chemistry facilities in Goessmann Laboratory, and also the biology laboratories in Clark Hall. These laboratories are overcrowded now. When we double the number of stu-

dents taking courses in them, we must make more room.

Under Chapter 599 of the Acts of 1947 the Trustees are instructed to build a Public Health Center on the campus. The Federal Government will contribute one-third of the cost. This building will house the district health office serving Central and Western Massachusetts. The University will use it as a teaching center for public health personnel. This building will free space for larger zoology laboratories which are under the same pressure as the laboratories in the chemistry building and Clark Hall. We believe that the time has come when this building should be built and we are asking the Legislature to finance it this year.

We are asking for funds to increase the size of the library also. Our library was built by State and Federal funds in 1935, when we had an undergraduate enrollment of 1069. We have a beautiful library but it is inadequate for the present and future student body. The library is the very heart of the University and we must make it possible for many more students to use the library at one time. Fortunately, this modern building was so constructed that it can be enlarged readily.

COMMUNITY COLLEGES

The closing in June of the University at Fort Devens will bring to an end an interesting, useful, and successful venture in higher education under emergency conditions. Without it the University could not have met the needs of Massachusetts veterans for college training. These veterans have continued to maintain high standards of scholarship and responsibility.

There is every indication that continuing pressure for admissions will keep enrollment at a high level in the next few years. A larger percentage of high school graduates than ever before seek entrance to college. As early as April of last year we had received more than 2000 applications for admission from Massachusetts boys and girls and nearly 5000 more requests for application blanks.

More than 40,000 boys and girls were graduated from approximately 400 public and private high schools in Massachusetts last June. Admitting 400 freshmen each year we could average only one student from each secondary school. We expect soon to be able to average two students but there will still be large numbers not provided for anywhere.

Experience in other states over a long period has shown that large numbers of high school graduates who wish more education can be accommodated satisfactorily in local or community colleges offering two-year programs. Only about 20% ,or one in five, have gone on to four years of college and the baccalaureate degree.

To make sure that this 20% can continue their education, the curriculum of the community college should provide a route which will make possible the transfer of a few students to other colleges and universities for junior and senior courses. Aside from that, the courses should be considered terminal. They should be adjusted closely to the needs of the community for general education and semi-professional or purely vocational instruction. Community colleges should also be centers for adult education and such industrial extension work as may be developed.

Even more than other parts of the public school system, the community college should be geared very closely into local industries, services, and institutions. Control should be vested in a local board of trustees with a minimum of outside interference. Since a community college could be maintained in a large center of population only, it should not look to the State for heavy financial subsidies with attendant loss of local interest and loss of local control over a local problem.

The proposal has been made that all developments in this direction be made a part of the University. The State university might be able to administer them as well as any outside authority, but there is too much to lose and too little to gain to put our institutions into lock step under the control of those, who, however able and well meaning, are far removed from the places where problems originate and where they must be solved.

There are now 13 private "junior" colleges in Massachusetts and 5 public institutions in that field. The Commonwealth is organizing an experimental community college at Fitchburg and doubtless there will be an expansion of such facilities as the right form of organization appears.

The University should prepare to accept substantial numbers of transfers coming in as juniors from two-year colleges. This does not mean that these colleges must be a part of the University, any more than are the high schools. Controls

are simple and automatic: when graduates cannot transfer with full credit the courses are weak, and local pride and local pressures will bring them into line.

COLLEGE OF ARTS AND SCIENCES

The union of the School of Science and the School of Liberal Arts to form a College of Arts and Sciences awaits final approval by the Trustees and the creation of a position to permit the appointment of a dean of the new College. This College of Arts and Sciences should form the center around which the professional schools are organized. All students will enroll in this College for courses in general education and basic pre-professional sciences, in preparation for the more intensive and specialized work to follow. The program of these first two years will be characterized by breadth and range.

Bringing the schools together will make possible a better integration of courses and a better coordination in our long-established core curriculum. It should strengthen our whole organization and I hope we can effect the combination before next September.

THE GRADUATE SCHOOL

The demand for graduate courses has grown steadily, especially in the sciences. The organized, tested and coordinated information which we call Science has become so extensive that professional competence in almost any field requires more than the ordinary four years of study at college level. This demand may be expected to increase and the University should meet it as a service to graduate education and also for its effect on all other teaching. A few good graduate students and a modest research program will do much to stimulate a department toward the development of its full potentialities.

During the past year we have limited our graduate school to 221 students including 26 from foreign nations. This school has continued to maintain the high standards it has had since it was organized as a separate school in 1908.

We cannot expand our graduate school until after the next academic year because of the veteran "bulge" in undergraduate schools, but later we should plan a gradual development which will importantly increase the services of the University to the Commonwealth.

CONTROL OF POLICY

Under the law the University is controlled as to policy by this Board of Trustees, which is responsible to the Governor. The University is operated, in other words, as a department of the Commonwealth. In financial matters the University is closely coordinated with all other state departments, and this control of finances carries with it a great deal of policy control, since policies often involve finances. Policy control of all the other State institutions of education beyond the high school is vested in the Board of Education, and this general form of organization is followed in many states.

Each year bills are presented to the Legislature which would in effect place the University beside the State teachers colleges and technical schools, and coordinate with them. I can see no advantage to anyone in this organization. The University is already correlated closely with all departments in financial matters and an elaborate organization for policy control, eliminating the trustees, could only be a clog on the day-to-day operation of the University.

COOPERATION IN HIGHER EDUCATION

A year ago the trustees approved in principle a project looking toward cooperation among the Land-Grant Colleges of New England in the establishment of services of such a nature that one School in a New England land-grant University might well serve all New England. This is a long time project. The start is slow, but it is moving forward.

The New England Governors' Conference became interested last summer in the closer integration of all possible state services, including higher education, and appointed a committee of educators to advise them as to possibilities in the educational field. The Committee suggested that a co-ordinating group be formed from the trustees of the public institutions involved, since it could move more rapidly and surely than any other organization, and would always be informed as to existing facilities. We await the reaction of the Governors' Conference to that suggestion.

Public opinion seems to be crystallizing into general agreement on what American education should do and who should get it. "For each according to his need; to each according to his ability" has become the ideal of education in this country. The realization of that ideal must be preceded

by a period of development but the direction of that evolution has been charted more clearly than ever before.

This guidepost indicates the direction in which the University should develop. It is the task of the University to provide general education and professional training with high standards to those best able to profit from the instruction, with the emphasis on ability only. We must select as students the most able applicants, we must find more ways to help those who lack funds, and we must give them all the best education made possible by our resources. We should look forward to a time when we can accept all applicants able to absorb instruction at a high university level. We must keep the University within the financial reach of low and moderate income families.

One of the best aspects of the State university is that it brings together on one campus students who are majoring in liberal arts and science, agriculture and forestry, home economics and engineering. We bring together students of different interests and backgrounds, and we have a core curriculum designed to give all of them a first-rate general education, as well as to equip them for specialized professions such as teaching, farming, journalism, landscape architecture, business and accounting, food technology, public health work, civil and electrical and mechanical and chemical engineering, and the various scientific fields, such as physics, biology, chemistry and geology.

We are a small university, but we have the varied aspects and the potentialities for becoming a university great in the quality of its work.

I concluded my first annual report last year by mentioning the fundamental importance of teaching and research. After the present emergency is over teaching loads should be lightened to provide time for a better program of research and scholarship, for the value of such work in itself and to enrich our teaching program. During the coming year time will be limited, but we must hold fast to our goal of developing a well-rounded university that can meet fully the more important needs of the people of the Commonwealth.

R. A. VAN METER,

January 19, 1949.

President

UNIVERSITY OF MASSACHUSETTS ENROLLMENT

October 1948

UNDERGRADUATE COLLEGE AT AMHERST

SCHOOL	1949		1950		1951		1952		Total		Total
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	
Liberal Arts	121	75	236	41	57	55	59	87	474	258	732
Science	115	38	191	33	73	36	74	48	453	155	608
Engineering	21	0	295	0	35	0	54	0	405	0	405
Horticulture	47	5	114	2	42	6	29	3	232	16	248
Business											
Administration	19	0	140	1	36	5	30	7	225	13	238
Agriculture	34	0	64	3	50	1	39	0	187	4	191
Home Economics	0	26	0	31	0	42	0	36	0	135	135
Division of											
Physical											
Education	6	0	22	0	9	0	5	0	42	0	42
Specials									5	8	13
TOTAL	364	144	1062	111	302	145	290	181	2023	589	2612

GRADUATE SCHOOL (October 1948)

Men	Women	Total
173	48	221

STOCKBRIDGE SCHOOL (October 1948)

1949		1950		Total
Men	Women	Men	Women	
176	3	229	4	412

SUMMARY (October 1948)

Undergraduate College at Amherst	2612
Undergraduate College at Devens	813
Stockbridge School	412
Graduate School	221
TOTAL	4058

Office of Publications, October, 1948

MAJOR BUILDINGS CONSTRUCTED AT THE UNIVERSITY — 1929-1949

<u>NAME</u>	<u>COMPLETED</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>PRIVATE</u> (Gifts or Alumni Corp.)
Food Technology	1929	\$70,000		
Depression and War Years (1929-1946)				
Physical Education Bldg.	1931	\$172,500		\$115,000
Thatcher House	1935	\$116,370	\$77,580	
Goodell Library	1935	\$143,100	\$95,400	
Lewis House	1940			\$177,000
Butterfield House	1941			\$232,600
Post-War Building Starting 1946				
Federal & Commonwealth Circles, 18 Temporary Buildings	1946	\$40,000	\$200,000 (Est.)	
Chadbourne House				
Greenough House	1947			\$550,000
Wooden Classroom and Laboratory and Dining Hall Annex Buildings	1947	\$25,000	\$400,000 (Est.)	
Home Economics Building Authorized 1946	1948	\$643,750		
Physics Building Authorized 1946				
Re-authorized 1947	May 1949	\$518,000		
Animal Pathology Bldg. Authorized 1946				
Re-authorized 1947		\$518,000		
Waltham Field Station Authorized 1946				
Re-authorized 1947		\$275,000		
Mills House Authorized 1946	Feb. 1949			\$400,000
3 Cement-Block Dormitories Authorized 1947	1948	\$522,000		
Gunness Laboratory Authorized 1947	June 1949	\$424,000		
Engineering Annex Authorized 1947	1948	\$120,000		
Boiler and Laboratory Equipment for New Bldgs. (2 Special Appropriations, 1947)		\$162,500		
Dutch Elm Laboratory Authorized 1948	Feb. 1949	\$24,500		
2 Cement-Block Dormitories Authorized 1948	Feb. 1949	\$350,000		
6th, 7th and 8th Alumni Dormitories Authorized 1948				\$1,000,000
Faculty-Student Apartment Bldg. Authorized 1948				\$500,000
Power Plant and Utility Lines Authorized 1948		\$1,361,000		
Wing of Main Engineering Bldg. Authorized 1948		\$500,000		
20-YEAR TOTAL		\$5,985,720	\$772,980	\$2,974,600

Office of Publications, February 1, 1949



THE UNIVERSITY OF MASSACHUSETTS BULLETIN



Annual Undergraduate Catalogue

**UNDERGRADUATE
SCHOOLS - 1949 - 50**





MEMORIAL HALL AND CAMPUS POND

The 700-acre campus is laid out in the form of an oval set off by the campus pond in the center. Memorial Hall was built by the Alumni as a memorial to the State University men who gave their lives in the first World War. The building is used as a student activities center, and for Alumni Association offices.



GOODELL LIBRARY



FOYER OF GOODELL LIBRARY

Bulletin
**UNIVERSITY
OF
MASSACHUSETTS**

**CATALOGUE OF THE UNIVERSITY
1949-1950**



AMHERST, MASSACHUSETTS

VOLUME XLI

FEBRUARY, 1949

NUMBER 2

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GEORGE J. CRONIN, STATE PURCHASING AGENT**

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FOREWORD

This Catalogue of the University presents announcements concerning courses, admission, etc., for the sessions of 1949-50.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

The University Catalogue for the sessions 1949-50 is part of the Eighty-fifth Annual Report of the University of Massachusetts and as such is part II of Public Document 31. (Sec. 8, Chapter 75, of the General Laws of Massachusetts.)

ACADEMIC CALENDAR

1949

AT AMHERST

June 10, Friday and June 11, Saturday. Entrance Examinations.

June 13, Monday. Registration for Summer Session.

June 14, Tuesday, 8:00 A.M. Summer Session opens.

July 4, Monday. Independence Day. No college exercises.

July 23, Saturday, 12:00 M. End of first six weeks of Summer Session.

July 25, Monday, 8:00 A.M. Summer Session opens for second half.

September 3, Saturday, 12:00 M. End of Summer Session.

September 19, Monday, 9:00 A.M. Registration of Freshman and Senior Students.

September 20, Tuesday, 9:00 A.M. Registration of Sophomore and Junior Students.

September 21, Wednesday, 2:00 P.M. Opening Convocation.

September 22, Thursday, 8:00 A.M. Classes begin.

October 12, Wednesday, Columbus Day. No college exercises.

November 11, Friday, Armistice Day. No college exercises.

November 23, Wednesday, 12:00 M. to November 28, Monday, 8:00 A.M. Thanksgiving Recess.

December 17, Saturday, 12:00 M. to January 3, 1950, Tuesday, 8:00 A.M. Christmas Recess.

1950

January 3, Tuesday, 8:00 A.M. Classes resume.

January 19, Thursday, 5:00 P.M. Classes stop.

January 20, Friday, 9:00 A.M. Registration of Freshman and Senior Students.

January 21, Saturday, 9:00 A.M. Registration of Sophomore and Junior Students.

January 23, Monday to February 1, Wednesday. Final Examinations.

February 1, Wednesday. First Semester ends.

February 6, Monday, 8:00 A.M. Second Semester begins.

February 22, Wednesday. Washington's Birthday. No college exercises.

April 1, Saturday, 12:00 M. to April 10, Monday, 8:00 A.M. Spring Recess.

April 19, Wednesday. Patriots' Day. No college exercises.

May 23, Tuesday, 12:00 M. Classes stop.

May 24, Wednesday to June 1, Thursday, 5:00 P.M. Final examinations.

May 30, Tuesday. Memorial Day. No college exercises.

June 2, Friday to June 5, Monday. Commencement.

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Organization of January, 1949

ERNEST HOFTYZER, B.S. (Ohio State University), Wellesley	1950
ALDEN CHASE BRETT, B.S. (University of Massachusetts), Belmont	1950
MRS. ELIZABETH LAURA McNAMARA (Graduate Teacher's College), Cambridge	1951
LEONARD CARMICHAEL, S.B., SC.D. (Tufts College), PH.D. (Harvard University), LITT.D. (Portia), LL.D. (Boston University, Colgate University, Northeastern University, Rhode Island State College, St. Lawrence University), Medford	1951
MRS. JOSEPH SWAN LEACH, Walpole	1952
RALPH FRED TABER, B.S. (University of Massachusetts), A.M. (Harvard University), West Newton	1952
JOHN MARTIN DEELY, A.B. (Williams College), Lee	1953
CLIFFORD CHESLEY HUBBARD, A.B., PH.D. (Brown University), A.M. (Harvard University), Mansfield	1953
HARRY DUNLAP BROWN, B.S. (University of Massachusetts), Billerica	1954
JOHN WILLIAM HAIGIS, M.A. (Amherst College), Greenfield	1954
JOSEPH WARREN BARTLETT, A.B. (Dartmouth College), LL.B. (Harvard University), LL.D. (University of Massachusetts), Boston	1955
PHILIP FERRY WHITMORE, B.S. (University of Massachusetts), Sunderland	1955
WILLIAM MICHAEL CASHIN, A.B. (Boston College), Milton	1956
WILLIAM AYLOTT ORTON, B.A., M.A. (Christ's College, Cambridge), M.SC., D.SC. (University of London), LL.D. (Boston College), Northampton	1956

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STUDENT LIFE

Chairman HELMING, COFFEY, CURTIS, HOPKINS, LANPHEAR, D. E. ROSS, J. H. SMITH, TOTMAN.

VISUAL EDUCATION

Chairman BARRETT, L. E. BRIGGS, CARPENTER, GODING, LANPHEAR, PURVIS, RHODES, VONDELL, WEAVER.

STANDING COMMITTEES OF THE
FACULTY 1949-1950
FORT DEVENS

ACTIVITIES

LESLIE F. ROSE, PARKER J. DEXTER, CLEMENS DE BAILLOU,
DONALD F. FENN.

AD-DIV-FAC REPRESENTATIVES

LEONARD E. ARNAUD, ARTHUR G. HILDRETH.

ATHLETICS

RALPH W. O'ROURKE, FRANCIS B. SHEPARDSON, EDMUND C.
TALBOT.

CAMPUS

WARREN D. BURRINGTON, HAMILTON A. MATHES, ROBERT DAVIS,
BARBARA M. CALHOUN.

FACULTY JUDICIARY REPRESENTATIVE TO
STUDENT SENATE

LEWIS I. MADDOCKS.

LIBRARY

R. BRASSIL FITZGERALD, EDWARD ADAMS, OTTO NIEUWEJAAR,
ALVAN S. RYAN.

MARSHAL

LEONARD E. ARNAUD.

ORGANIZATION

GEORGE GENZMER, ROBERT BACON, SOLOMON H. GORDON, FRAN-
CIS J. RIEL, JOHN M. GLOWACKI.

FACULTY PLACEMENT

ALVAN S. RYAN, GERARD CAMPAGNA, ANTHONY F. LIPP, HAROLD
KAPLAN, JOHN L. WARNECK, GEORGE H. BISCHOFF.

PUBLICATIONS

LOYD HABERLY, ERNEST L. RHODES, BORIS E. NELSON, JULIAN
ROBERTS.

PUBLICITY

JOHN F. MCKENZIE, ERNEST L. RHODES, JOHN BUCHER.

SCHOLARSHIP

FRANCIS B. SHEPARDSON, CHARLES J. SCULLY, PAUL CAVANAUGH.

SECRETARY

JULIAN ROBERTS.

REPRESENTATIVES TO STUDENT SENATE

WILLIAM J. WALL, JR., JOHN X. WALSH.

UNIVERSITY OF MASSACHUSETTS

The University of Massachusetts is the State Institution of the Commonwealth founded under the provisions of the Morrill Land Grant Act of Congress of 1862. This Act provided in each state for "the endowment for and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Massachusetts accepted the provisions of the Morrill Act in 1863 by founding a new college at Amherst to be known as "Massachusetts Agricultural College" and Chapter 75 of the General Laws of the Commonwealth states that "the leading object of the College shall be to teach subjects relating to agriculture and the mechanic arts so as to promote liberal and practical education. Its curriculum may include other scientific and classical studies and shall include military tactics."

The Trustees of Massachusetts Agricultural College were incorporated in 1863 and officers were appointed in that year. It was not until October 2, 1867, however, that the College was formally opened to students. At that time there were four teachers on the faculty and four wooden buildings on the campus. The enrollment steadily increased during the first term, however, and by December 1867, forty-seven had been admitted. From this modest beginning the College has grown steadily both in number of students and scope of its work. In April 1931, the name of the institution was changed by legislative enactment to Massachusetts State College. In 1939 the Trustees voted to award the A.B. degree as well as the B.S. which previously had been the undergraduate degree of the College. In May 1947 the College became the University of Massachusetts.

FUNCTIONS OF THE UNIVERSITY

The University of Massachusetts now serves the Commonwealth in the three important fields of resident instruction, research, and extension. Since all three services are organized on the campus, students have the advantages that come through contact with those carrying education to the state at large and conducting original investigation as well as those engaged in formal instruction.

RESIDENT INSTRUCTION

DEGREE COURSES

THE UNDERGRADUATE COLLEGE. The University offers four year undergraduate instruction leading to the following degrees, Bachelor of Science, Bachelor of Arts, Bachelor of Science in Agricultural, Civil, Electrical and Mechanical Engineering, Bachelor of Business Administration and Bachelor of Vocational Agriculture.

This instruction is assigned to the College of Arts and Sciences, the Schools of Agriculture, Business Administration, Engineering, Home Economics and Horticulture, and to the Division of Physical Education. The aim of the four year course is to give as high a degree of proficiency in some particular branch of learning as is possible without sacrificing the breadth, knowledge, and training which should characterize a well-rounded college education.

The Degree of Bachelor of Science is conferred upon those candidates who complete the curriculum requirements of the first two years, the specialization requirements of the Junior and Senior years, plus additional credits to bring the total Junior-Senior credits to sixty in Science departments of the College of Arts and Sciences, in the Schools of Agriculture, Horticulture and Home Economics, and in the Division of Physical Education for Men. This degree will also be granted to students majoring in Psychology or Education who elect fifteen credits in the School of Science in the Junior and Senior years.

The degree of Bachelor of Arts is awarded to all candidates in the College of Arts and Sciences who complete their major work in other than any of the Science departments, who complete requirements of the freshman and sophomore years, the departmental specialization requirements of the junior and senior years and enough additional credits to bring the two year total to 60. Students in Science departments may qualify for the A.B. degree by satisfying the requirements of the College of Arts and Sciences for the freshman and sophomore years, completing the departmental requirements in the junior and senior years, and supplementing these with a second year of foreign language and 18 additional credits selected from English, History, Romance Languages, Philosophy, Music and Art.

All graduates from the School of Engineering will receive the appropriate degrees of Bachelor of Science in Civil Engineering, Electrical Engineering, Mechanical Engineering and Agricultural Engineering.

Graduates majoring in Light Building Construction will receive the Bachelor of Science degree.

All graduates from the School of Business Administration will receive the degree Bachelor of Business Administration.

Special arrangement is made for some graduates of county agricultural schools and of agricultural departments of certain high schools to complete the college course with majors in agriculture or horticulture. Upon the completion of their course they will be granted a Bachelor of Vocational Agriculture degree.

THE GRADUATE SCHOOL. Graduate courses leading to advanced degrees are available in the Graduate School. Majors leading to the Master of Science or Doctor of Philosophy degree may be taken in the following fields: Agronomy, Bacteriology, Botany, Chemistry, Economics, Entomology, and Food Technology.

In addition, the following departments offer major work leading to a Master of Science degree only: Agricultural Economics and Farm Management, Animal Husbandry, Business Administration, Dairy Industry, Education, Floriculture, Geology and Mineralogy, Home Economics, Mathematics, Olericulture, Physical Education (Men), Pomology, Poultry Science, Psychology, Romance Languages, Wildlife Management, and Zoology.

The degree of Master of Landscape Architecture is granted to students completing the two years' graduate work offered by the Department of Landscape Architecture; while students taking the equivalent of one year's graduate work in that major may be granted the degree of Bachelor of Landscape Architecture.

Several other departments in the University, while not regularly organized for major work in the Graduate School, do, nevertheless, offer courses which may be selected for minor credit. These are: Engineering, English, French, Forestry, German, History, Philosophy, Physics, Sociology, and Veterinary Science.

The general requirements of the Graduate School regarding entrance, residence, credits, tuition, fees, etc., together with specific information concerning details of interest to prospective students are set down in a separate bulletin which may be obtained upon request from the Director of the Graduate School.

THE SUMMER SCHOOL. A twelve weeks' Summer Session is available for those desiring to accelerate their program. This Summer Session is planned to serve the needs of (1) all students enrolled as candidates for a degree at any college, (2) those desiring refresher or professional improvement courses, (3) graduate students desirous of meeting specific requirements in certain fields, (4) any adult person who finds courses suited to his preparation and needs, and (5) any men discharged from the Armed Forces who desire to resume their college program or take special courses for specific rehabilitation objectives. Applications for the Summer School may be obtained by writing to the Dean of the University.

NON-DEGREE SHORT COURSES

The University, through its Short Course division, as a special service under the Land-Grant Act by which it was established, provides a complete program of two-year technical and vocational courses in the fields of agriculture and horticulture. These train for all types of commercial farming operations as practiced in New England.

Other short courses, varying in length from one to ten weeks, furnish supplementary training for skilled workers in dairy and ice cream plants, milk, laboratories, for city and town sanitary inspectors; tree wardens and foresters, and golf course greenkeepers.

THE STOCKBRIDGE SCHOOL OF AGRICULTURE. This School was organized at the University in 1918 under the name of "The Two Year Course in Practical Agriculture," for the purpose of meeting the demand for shorter courses in agriculture which might be taken by high school graduates who could not satisfy college entrance requirements or who, for one reason or another, were unable to take the four year college course. In 1928 the School was given its present name in honor of Levi Stockbridge, first professor of agriculture in the University and its fifth president.

This program trains men and women primarily for the practice of farming or associated agricultural industries. Graduation from the School does not fulfill the requirements for entrance into the degree course nor are credits earned during the course transferable regularly toward credit for a degree. A diploma is awarded for satisfactory completion of any two-year course; for other short courses certificates are presented.

As the two-year program is now organized a student may choose any one of eleven vocational courses including dairy farming, dairy manufactures or milk plant operation; poultry farming, arboriculture or the care of trees; fine turf maintenance for golf courses, cemeteries, park, and play-grounds; commercial flower growing, both retail and wholesale; food management for clubs, hotels, and restaurants; commercial fruit farming, ornamental horticulture or landscape gardening; commercial vegetable farming, and applied forestry for timber growing and forest products industries.

On-the-job placement training is required of all first year students in the second semester for a period of four to seven months, depending on type of employment. No student can earn diploma of graduation without this applied training experience. Wages earned can pay greater part of second year expenses where student is forced to economize.

Limited enrollment quotas in each major course make necessary early filing of application. No formal entrance examinations are required for non-degree short courses.

Catalog is available giving complete description of all two-year courses offered in The Stockbridge School of

Agriculture, as well as full details on estimated costs, employment opportunities in each field, and entrance arrangements. Application form is printed in catalog. Write to Director of Short Courses, University of Massachusetts, Amherst, Massachusetts.

NOTE: (For interview or personal conference the Short Course Office is open Monday through Friday from 8:30 to 12:00 and 1:00 to 5:00, state and national holidays excepted.)

RESEARCH AND REGULATORY SERVICES

The University of Massachusetts serves the fields of Agriculture and Horticulture through its Experiment Station which provides research and regulatory services. Experiment Stations were established in all States as the need for development of practical information on subjects relating to Agriculture became apparent. Through the efforts of Experiment Stations a fund of scientific knowledge applicable to Agriculture and Horticulture has been accumulated, and research workers in the Experiment Stations continue to contribute to this knowledge by constant research and experimentation.

At the University of Massachusetts, the Experiment Station service has expanded until it now deals with problems in the following fields of specialization: Agricultural Economics and Farm Management, Agronomy, Animal Husbandry, Bacteriology, Botany, Chemistry, Dairy Industry, Economics, Engineering, Entomology, Horticulture, Floriculture, Food Technology, Nutrition, Olericulture, Pomology, Poultry Science, and Veterinary Science. Most of the research activities of the University of Massachusetts are undertaken at the main Experiment Station at Amherst. There are, however, two substations, one at Waltham, devoted largely to the problems of Horticulture as applied to Olericulture, Floriculture, and Nurseryculture, and one at East Wareham, where attempts are in progress to solve the problems of the cranberry and blueberry growers.

In addition to the work described above, the administration of certain regulatory services, as pertaining to the sale of feeds, fertilizers, and seeds and to the use of dairy glassware, is also assigned to the Experiment Station which is equipped with the necessary laboratory facilities and personnel for that purpose.

EXTENSION SERVICE

The Massachusetts Extension Service is a cooperative teaching effort between the United States Department of Agriculture, the University of Massachusetts and the several counties of the State. It is done through unified teaching programs carried to all parts of Massachusetts. It assists the people of the farm, the home, and the rural communities to improve agriculture, homemaking, and rural life. Extension educational teaching plans are made in council with the

people. They determine their problems and help to suggest methods and practices for their solution.

This cooperative effort was brought about under the Federal Smith-Lever Law passed by Congress on May 8, 1914. Since that time, the service has grown to a staff of over 100 state and county workers who conduct an educational program in all phases of agriculture and homemaking among the adults and young people (4-H club work) of the State. All types of methods, including subject-matter meetings, demonstrations, farm and home visits, publications, visual aids, and radio, are used in carrying out this educational program directly in the farm and rural areas of the State. During the war emergency, the Extension Service extended its home food production and preservation program to the urban areas.

THE UNIVERSITY CAMPUS

The University of Massachusetts is located near the geographical center of the State at Amherst. This town of about 7,000 overlooks one of the most picturesque sections of the Connecticut River Valley. The valley is noted both for its scenic beauty and its educational institutions. The setting for the University, therefore, is ideal. The surrounding county is a rich agricultural region providing an excellent outdoor laboratory for the work in Agriculture and Horticulture as well as for the Biological Sciences and Geology. Those interested in other Sciences and Liberal Arts study under equally favorable conditions both because of the facilities at the University and its location in this educational area of the valley.

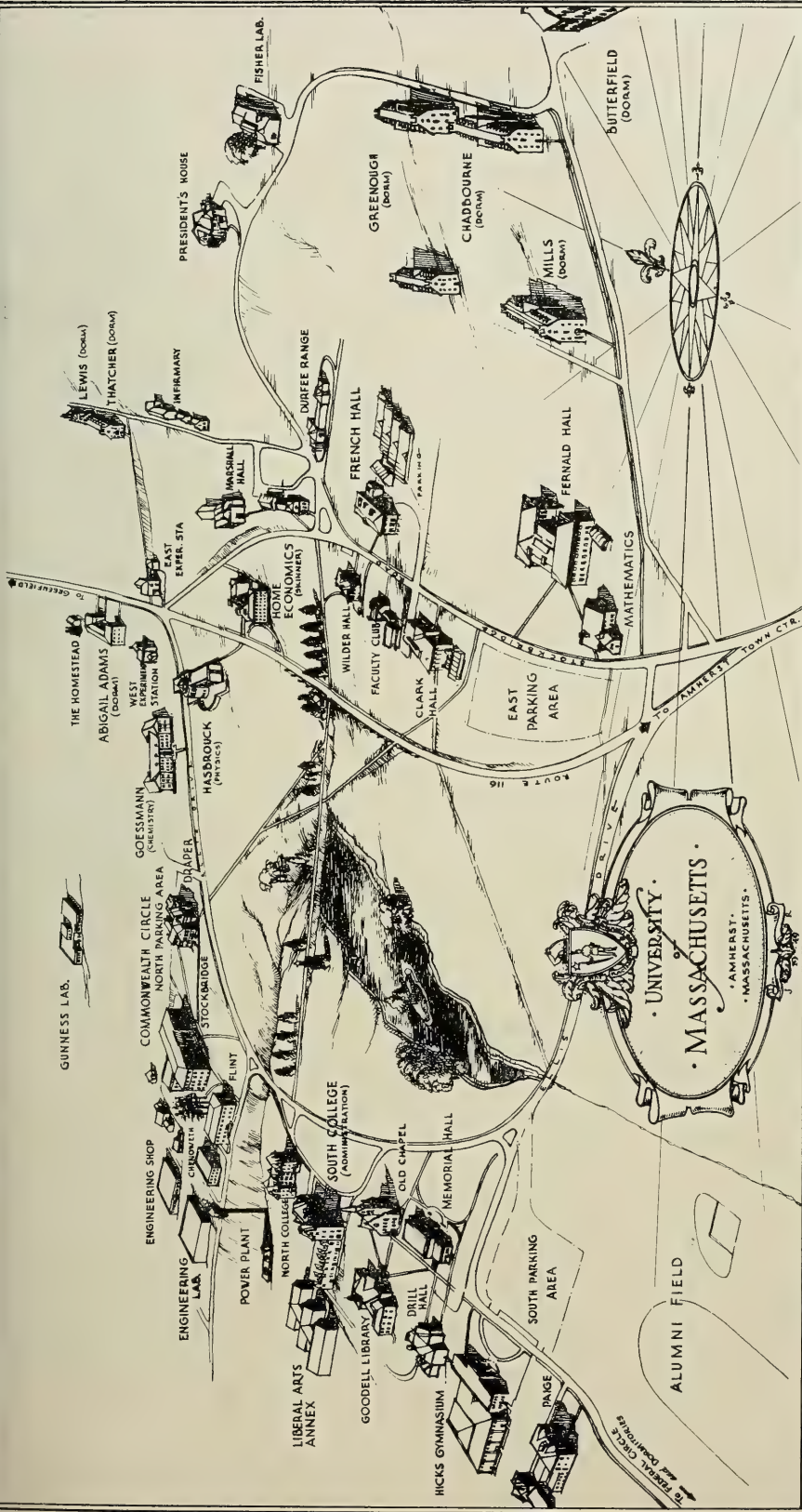
Amherst is eighty-seven miles from Boston and may be reached by bus connections from Northampton, Greenfield, Springfield, and Worcester. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. In addition, the University owns another area of seven hundred and fifty-five acres six miles north of the campus on Mount Toby. This is used as a demonstration forest.

The University also operates a horticultural field station at Waltham and a cranberry field station at East Wareham.

BUILDINGS AND EQUIPMENT

The campus is laid out in the form of an oval attractively set off by the College Pond in the center. Around this oval are grouped the main buildings of the University. Those using the attached map of the campus are advised to start at South College, the Administration Building, and proceed in the order indicated below.

SOUTH COLLEGE.—Here are located the administrative offices including those of the President, Dean, Registrar, Treasurer, Secretary, Director of the Extension Service, of Short Courses and the Stockbridge School of Agriculture, Placement Service, and the Dean of Women. Erected 1885.



MAP OF STATE UNIVERSITY CAMPUS NEAR GEOGRAPHICAL CENTER OF MASSACHUSETTS



BUTTERFIELD DORMITORY FOR FRESHMEN



LEWIS AND THATCHER DORMITORIES FOR WOMEN

NORTH COLLEGE.—The University Store, offices and classrooms of the School of Business Administration and the Department of Economics. Erected 1868.

FARLEY 4-H CLUB BUILDING AND BOWDITCH LODGE.—Headquarters for 4-H Club Activities. Erected 1933 and 1936 by funds contributed by 4-H Club members and interested friends and organizations. Former was named to honor George L. Farley for twenty-five years State Leader of County Club Agents; the latter for Nathaniel Bowditch, Trustee of the University from 1896-1945.

POWER PLANT—General Maintenance.

LIBERAL ARTS BUILDING.—Classrooms, laboratories and offices for Foreign Languages, Psychology and Education. Erected 1947.

GRINNELL ARENA AND ABATTOIR.—Erected in 1910 primarily for livestock judging. An abattoir was constructed in 1930 as an addition to the original building. Named in honor of James S. Grinnell, for twenty-two years a trustee of the University.

FLINT LABORATORY.—Laboratories and classrooms for Dairy Industry. Erected in 1911 and named for Charles L. Flint, fourth president of the University.

STOCKBRIDGE HALL.—Departments of Agricultural Economics and Farm Management, Agronomy, Animal Husbandry, Engineering and Poultry Husbandry. Erected in 1914 and named for Levi Stockbridge, first Professor of Agriculture and a former President of the University. Bowker Auditorium, the main auditorium of the University, is located here. It is named for William H. Bowker, a member of the first graduating class, a trustee of the University, and one of the pioneers in the fertilizer industry.

CHENOWETH LABORATORY.—Classrooms and laboratories including a large Commercial Canning Practices Laboratory for the Department of Food Technology. Erected 1929 and named in honor of Walter W. Chenoweth, pioneer in the field of Food Technology and first Head of the Department.

NUTRITION LABORATORY.—A laboratory for the study of small animals and chickens in connection with investigations into human, animal, and poultry nutrition.

ENGINEERING ANNEX.—Laboratories, classrooms, and offices for the School of Engineering. Erected 1948.

ENGINEERING SHOP.—Laboratories and shop for machine tools, woodworking, motors, and welding instruction. Erected 1916.

DRAPER HALL.—University Dining Hall. Erected 1903 with an addition in 1912. Named in honor of James Draper, for twenty years a trustee of the University. Annex erected 1947.

COMMONWEALTH CIRCLE.—Five temporary buildings erected in cooperation with the Federal Government to provide additional housing at the time enrollment was rapidly

increasing due to admission of veterans. Accommodates approximately 225 students and includes offices for the Supervisor of University Housing. Erected 1946.

GOESSMANN LABORATORY.—Contains eight large laboratories, an auditorium, chemical library, and lecture rooms. The east wing of the third floor is used by the Experiment Station chemists. The remainder of the building is for resident instruction in Chemistry. Erected in 1924 and named in honor of Charles A. Goessmann, first Professor of Chemistry at the University.

WEST EXPERIMENT STATION.—The State Control Service is centralized here. Fertilizers, seeds, and feeds are analyzed or inspected in accordance with the State law. Erected 1886.

EAST EXPERIMENT STATION.—Here are located the offices of the Director of the Experiment Station and Graduate School and other administrative officials.

ABIGAIL ADAMS HOUSE.—Women's dormitory accommodating one hundred students. Erected in 1919 and named for Abigail Adams, wife of John Adams, second President of the United States.

THE HOMESTEAD.—Girls majoring in Home Economics receive their Home Management practice here. This is a fine old colonial homestead newly equipped with all the modern conveniences of the home.

ALUMNI DORMITORIES.—Two new dormitories being erected in 1949 by the University of Massachusetts Alumni Building Corporation. When completed, they will house approximately 150 each.

LEWIS HOUSE.—Women's dormitory accommodating one hundred and fifty students. A self-liquidating dormitory erected under the sponsorship of the Associate Alumni in 1940 and named in honor of Edward M. Lewis, Dean of the College 1914-25 and President 1925-27.

THATCHER HOUSE.—Women's dormitory with facilities for one hundred and fifty students. Erected in 1935 and named in honor of Roscoe W. Thatcher, President of the College 1927-32.

UNIVERSITY INFIRMARY.—A group of three buildings, one for bed patients, one for out patients and a third for contagious cases.

MARSHALL HALL.—Erected in 1915 and named for Dr. Charles Marshall, a former Professor of Bacteriology and Director of the Graduate School. The building provides laboratories and classroom space for the Department of Bacteriology and the Department of Zoology.

SKINNER HALL.—Laboratories, class rooms and offices for the School of Home Economics. Erected in 1947 and named in honor of Edna L. Skinner, first Dean of the School of Home Economics.

HASBROUCK PHYSICS LABORATORY.—Completed in 1949. Contains laboratories and lecture rooms designed for the various main divisions of Physics. Named in honor of Philip B. Hasbrouck, Professor of Physics and Registrar of the College in the period 1905 to 1924.

FORESTRY SCIENCES.—Formerly the Old Botany Museum erected 1867. Houses laboratories, classrooms and offices for the Departments of Forestry and Wildlife Management.

FISHER LABORATORY.—Erected in 1910 and named for Jabez Fisher, one of the foremost early horticulturists of the State. Laboratories for Pomology. Included are a quick freezing room, six refrigerator rooms, two rooms for the storage of frozen products, two classrooms, and three packing rooms.

WILD LIFE LABORATORY.—Laboratories for the Department of Wild Life Management.

WILDER HALL.—Here are the classrooms, drafting rooms, and offices of the Department of Landscape Architecture. Erected in 1905 and named for Marshall P. Wilder, a pioneer in the movement for agricultural education in Massachusetts, and one of the first trustees of the College.

FRENCH HALL.—French Hall houses the Departments of Floriculture, Forestry, Pomology, and Olericulture. In the rear of the building is the new Durfee range of greenhouses devoted to the growing of carnations, roses, chrysanthemums, etc. One house is maintained as a conservatory and contains a collection of plants used primarily for decorative purposes. The old Durfee range just north of French includes a collection of tropical and semi-tropical plants of botanical and horticultural importance.

STOCKBRIDGE HOUSE.—Faculty Club House. On the rear of the Stockbridge House is a new wing added in 1948 to house the research laboratories and staff engaged in control of the Dutch Elm Disease.

CLARK HALL.—Offices, lecture rooms, laboratories, and greenhouses of the Department of Botany are located here. The herbarium contains about twenty thousand sheets of seed plants and ferns, twelve hundred sheets of liverworts and mosses, and a collection of twenty-five thousand specimens of fungi. The building was erected in 1906 and named in honor of William S. Clark, President of the College and Professor of Botany from 1867 to 1879.

FERNALD HALL.—Erected in 1909 and named in honor of Professor Charles H. Fernald who served the College from 1886 to 1909, built up a strong Department of Zoology, created the Department of Entomology, and acted as Director of the Graduate School. Fernald Hall houses the Departments of Entomology and Geology and offices and classrooms of the Department of Zoology. Offices and laboratories of the Western Sanitary District, Massachusetts Department of Public Health are also located here. The Entomology

collection includes over 160,000 insects. There are also Geological and Zoological museums.

MATHEMATICS BUILDING.—Classrooms and offices of the Mathematics Department.

MILLS HOUSE.—Men's dormitory for one hundred and fifty students. A self-liquidating dormitory erected in 1948 under the sponsorship of the Associate Alumni. Named in honor of George F. Mills, teacher of English from 1899 to 1914 and Head of the Division of Humanities.

BUTTERFIELD HOUSE.—Men's dormitory including Dining Hall. Accommodates one hundred and fifty students. A self-liquidating dormitory erected in 1941 under the sponsorship of the Associate Alumni. Named in honor of Kenyon L. Butterfield, President of the College 1906-1923.

CHADBOURNE HOUSE.—Men's dormitory for one hundred and fifty students. A self-liquidating dormitory erected in 1946 under the sponsorship of the Associate Alumni. Named in honor of Paul Ansel Chadbourne, President 1866-67 and 1882-83.

GREENOUGH HOUSE.—Men's dormitory and Dining Hall. Houses one hundred and forty-eight students. A self-liquidating dormitory erected in 1946 under the sponsorship of the Associate Alumni. Named in honor of James Carruthers Greenough, President from 1883-86.

PAIGE LABORATORY.—The work in Veterinary Science is located here. In addition to class, lecture, and laboratory rooms, there are laboratories for the State Control and Research Work in animal diseases. The museum contains a growing number of anatomical and pathological specimens, most of which are used for teaching purposes. Erected in 1898 and named for James B. Paige, Professor of Veterinary Science from 1891-1922.

CURRY S. HICKS PHYSICAL EDUCATION BUILDING.—Erected in 1931 from funds contributed by Alumni and friends of the College plus an appropriation by the State Legislature. Contains a large swimming pool, an exercise hall, basketball floor, and locker rooms. The Health Office and x-ray room are also located here. Named for Curry S. Hicks, Professor of Physical Education since 1911.

ALUMNI FIELD.—So called because both funds and labor for its construction were contributed by alumni and students. Included are a baseball diamond, football and soccer fields, and a cinder track. Ten tennis courts are adjacent to the Physical Education Building.

ATHLETIC FIELD FOR WOMEN.—A large field west of the Physical Educational Building provides space for Archery, Softball, Field Hockey, and other women's activities.

FEDERAL CIRCLE.—A series of temporary buildings furnishing ninety-four apartments of varying size for married veterans. Erected in 1946 in cooperation with the Federal Government.

COUNTY CIRCLE.—Five residence halls erected in 1948 by the Commonwealth. Hampshire and Suffolk Houses contain thirty two and three room apartments for married persons and their families. Plymouth, Berkshire, and Middlesex Houses contain dormitory rooms for approximately 144 students each.

COLLEGE ARMORY.—Contains in addition to the offices of the Department of Military Science, the offices, locker and dressing rooms, and exercise hall for the Department of Physical Education for Women.

MEMORIAL HALL.—Erected in 1921 by Alumni and friends in memory of those men of the College who died in World War I. Included is a beautiful Memorial Room in which the names of those members of the College family who died in the service of their country are appropriately enshrined. This building is a social center of student life. Alumni headquarters are here as well as the offices of student organizations including the Senate, Collegian, and Index. The Associate Alumni are, at the present time, in the process of raising a fund to add a large wing to this building. The purpose of the new wing is to commemorate the sacrifices made by our college men who gave their lives for their country in World War II.

OLD CHAPEL.—Erected in 1885. Auditorium, seminar room, classrooms, and offices for English, History and Sociology.

GOODELL LIBRARY.—Goodell Library is named in honor of Henry Hill Goodell who served the College from 1867-1905. He was President from 1886 to 1905 and because of his deep enthusiasm for books also acted as Librarian of the College.

Goodell Library is a virtually fireproof building erected in 1935. Its plan is unique in that the book-stacks are open freely for inspection and borrowing.

The main floor includes a large reading room, a reference room, delivery desk, cataloging and administrative offices. On the second floor is another large reading room, commonly used for reserve book reading. There are also studies for faculty and students and the University of Massachusetts Memorabilia room.

Besides Goodell Library there are fifty-two departmental libraries ranging from small collections to sizable separate libraries with reading rooms and valuable collections of reference and text books.

The complete library system contains 150,000 volumes and is growing at the rate of over 4,000 volumes a year. The library regularly receives over 600 periodicals, and also the serial publications of learned societies. It is also a depository for government documents of the United States Department of Agriculture and the various State Experiment Stations.

UNIVERSITY OF MASSACHUSETTS AT FORT DEVENS

The University of Massachusetts at Fort Devens provides instruction of collegiate grade to Massachusetts veterans. This addition to the University of Massachusetts was established by legislative action on June 14, 1946.

The act provided that the Board of Trustees of Massachusetts State College be increased by the "addition of nine trustees to be appointed by the Governor, with the advice and consent of the Council, from the presidents of colleges and universities within the Commonwealth." The nine positions on what came to be known as the augmented Board were filled by the appointment of nine college presidents of the Commonwealth, President Conant of Harvard; President Compton of M. I. T.; President Cole of Amherst; President Baxter of Williams; President Keleher of Boston College; President Cluverius of Worcester Polytechnic Institute; President Healy of Holy Cross; President Marsh of Boston University; and President Ell of Northeastern. Father Healy was later replaced by his successor in the presidency of Holy Cross, the Very Rev. John A. O'Brien, and President Compton was replaced by his successor at M. I. T., Dr. Killian. With this illustrious group of educators presiding over the operation of the University of Massachusetts at Fort Devens, that special branch of the University may well boast that it has the most distinguished board of trustees in the country.

The act further provided that the augmented Board of Trustees shall serve for a term of five years, and "shall have responsibility only for the establishment, operation and termination of a branch of the University of Massachusetts for the purpose of providing instruction of collegiate grade to veterans of World War II who resided in this Commonwealth at the time of their entry into the service."

Under the augmented Board of Trustees, the University of Massachusetts at Fort Devens opened its first academic session with a convocation on 1 October 1946, at which Dr. Edward Hodnett was installed as Vice President of the University of Massachusetts to direct the Devens campus. Upon the resignation of Dr. Hodnett to become President of Fenn College in Cleveland, Ohio, Dr. Wentworth Williams, originally Dean of the Faculty, was installed as Vice President at a convocation on 1 October 1948, his term of office dating from 1 September.

The emergency conditions which the special addition to the University was established to meet have largely passed. Furthermore, a considerable expansion of the facilities of

the University campus at Amherst now enable the parent institution to increase its service to the veterans of the Commonwealth. It is, therefore, expected that with the academic term ending in June 1949, the Devens campus will be deactivated.

This campus of the University has operated on the accelerated three-semester basis and has accepted students at the opening of each semester in September, February, June, and through September, 1948. It has been open to all male veterans of Massachusetts who qualified academically and who are eligible under the G. I. Bill.

Situated in a setting of old New England villages in an area of great scenic beauty, the University of Massachusetts at Fort Devens is less than two miles from Ayer, Massachusetts, a junction for highway, train, and bus connections to all major cities in the Commonwealth and New England. The cities of Boston, Worcester, Lowell, and Fitchburg are but a short drive from the campus.

CAMPUS

Located within the reservation of an army post rich in New England history, the campus covers four square miles of rolling countryside. With its ivy-covered brick buildings, spacious, landscaped grounds and country atmosphere, the campus resembles that of a long-established institution.

All permanent buildings of the post are included in the college area. Built under various Federal appropriations since 1928, these buildings are Colonial in design, constructed of brick and reinforced concrete, and are modern in every respect. This section of the physical plant includes 110 housing units for faculty and key members of the administrative and operational staff.

For purposes of identification, buildings used for official activities of the college have been given names precisely as is done on any college campus. However, since the college exists without benefit of individual benefactors or long tradition, the names of its buildings draw directly from the history and traditions of the Commonwealth. Accordingly, the first buildings named—exclusive of Massachusetts Hall (the Administration Building)—were named after the fourteen counties of the State. All others bear names of individuals or events of early Colonial days, or of special points of historic interest.

The college library, located in Worcester House, provides reading, reference, open stack, and periodical rooms for the students of the campus. Starting from zero as of October 1, 1946, the library had acquired, in approximately thirty months of operation, some 16,000 volumes, and is still acquiring texts, reference books and periodicals essential to the development of a full-fledged college library. Specialized branch libraries are maintained at the offices of the various academic divisions

for the convenience and help of the faculty members concerned.

The college dining hall was originally located in Merrimack Hall, a former mess hall of the Army, on the edge of the campus approximately three-quarters of a mile from the centers of student life and activity. Since January 1, 1948, however, the completion of remodelling operations has enabled the college to operate its dining hall in the modern and pleasant facilities created in the south entry of Worcester House, and thus to provide the student body an opportunity to dine in surroundings more appropriate to the atmosphere of a college campus.

RECREATION AND STUDENT ACTIVITIES

A modern brick gymnasium, a nine-hole golf course, tennis courts, athletic fields, a toboggan slide, and a pond suitable for swimming and winter sports provide facilities which have made possible the development of a full athletic program featuring both varsity and intramural competitions. Varsity teams have had full schedules in football, soccer, cross country, basketball, hockey, baseball, track, and golf. Active intramural leagues have had competitions in touch football, basketball, baseball, and softball; the intramural program has been further augmented by boxing matches, golf tournaments, and tennis tournaments. A varied program of extra-curricular activities has flourished since the opening of the college. The student radio station is one of the finest in New England. A weekly newspaper and a literary quarterly are published throughout the academic year. An active dramatics group stages two to three programs each semester. Glee club, dance band, small symphony orchestra, and brass band cover the musical interests of the campus. A variety of clubs range from language and professional groups, through religious organizations, to hobby clubs and outing and skiing groups.

STUDENT GUIDANCE

Each student is assigned on entrance to a faculty advisor chosen for similarity of interests. The work of these advisors is coordinated through a Supervisor of Guidance and augmented by a complete testing center under the direction of the Psychology staff. The Supervisor of Guidance is a member of the Division of Records and Guidance, which centralizes all information about a student in one file so that each student can be given advice and assistance based on full information about his college life.

STUDENT GOVERNMENT

In order to assist the veteran in his readjustment to civilian life and to develop in him a sense of responsible leadership in a democratic society, a major share of the responsibility for student affairs is delegated by the college



DEVENS QUADRANGLE

Viewed across the former parade ground at Fort Devens are the four main dormitories—Worcester, Norfolk, Essex and Suffolk houses. These served as dormitories for most of the 2685 veterans who returned to the Army post to enroll in the University of Massachusetts at Fort Devens for the first two years of their college training. At extreme left is the Administration Building, and at extreme right is shown the Campus Theater. On May 29, 1949 this emergency addition to the University held its final Convocation exercises, and the last group of students were transferred to the permanent campus at Amherst.



OLD CHAPEL BUILDING AT AMHERST

administration to the student government. In form, the student government is a representative democracy. The Constitution was drawn up by a constitutional convention and adopted by general vote of the student body. Under it two senators from each dormitory group are elected to the student Senate, the body which administers all affairs affecting the student body. The Messing Committee, the Dormitory Committee, and student representatives on the college Scholarship and Curriculum Committees, are some of the executive agencies through which the Senate supervises the student affairs of the campus. In addition to the Senate, the Constitution provides for a Judicial Board to handle disciplinary cases, and an Activities Branch to supervise the extra-curricular life of the campus.

ACCOMPLISHMENT

The University of Massachusetts at Fort Devens accepted only veterans beginning their college course or those with a transfer credit which would not place them beyond the first two years of college. The curriculum was set up to parallel that of the Freshman and Sophomore years of the University of Massachusetts at Amherst.

The college was opened with an enrollment of 1317 for its first semester. The enrollment figure for the successive semesters is as follows: Spring 1947, 1537; Summer 1947, 762; Fall 1947, 1764; Spring 1948, 1479; Summer (2 terms), 366-222; Fall 1948, 810, and with an anticipated enrollment of 594 for the last academic session. In all a total of 2685 veterans of the Commonwealth have been enrolled.

Transfers to other colleges have in general taken place after four semesters on the Devens campus. 924, by far the greater majority, have continued their training at the Amherst campus of the University. Transfers have, however, been made to 100 other institutions ranging from the University of Sydney, Australia, to McGill University. Eleven have gone to M. I. T., three to Harvard, eleven to Tufts, and one hundred-eighteen to B. U., and in lesser numbers to a widely varied group of institutions.

The veterans enrolled at Fort Devens showed the same serious approach to their educational opportunities as has characterized comparable groups throughout the country. In many ways, however, even more impressive was the way in which, in the brief period of its existence, the Devens campus was marked by a spirit of loyalty to the institution and by a vigorous and varied campus life which would have done credit to any long-established and permanent institution. The spontaneous organization by former students of a Devens Alumni Association is perhaps the best proof of the fact that the veterans of the Commonwealth are satisfied with the special provisions taken to provide them their well-deserved educational opportunity.

INFORMATION CONCERNING THE UNIVERSITY COURSE

The sections of the catalogue that follow are primarily for undergraduate students in the four year degree course. Those interested in graduate study are referred to the Graduate School catalogue and in short courses to the catalogue of the Stockbridge School of Agriculture and other short course publications.

STUDENT EXPENSES

Expenses vary from approximately \$650 to \$750 per year for the normally economical student. First year costs are usually greater than those of the other three years and there is less opportunity to earn. A student is advised to have a definite plan for meeting the expenses of the first year before entering.

The following estimate of a year's expenses, based upon last year's costs, includes only those items which are strictly college and does not include amounts for clothing, laundry, travel, etc. These costs vary slightly from year to year. Tuition for residents of Massachusetts is \$100 per year and for others \$400.

	Normal
Tuition (citizens of Massachusetts)	\$100.00
Room in college dormitory or private home (ave.)	150.00
Board at University Dining Hall	340.00
Books, stationery, and other supplies	90.00
Student Tax	38.50
	\$718.50

INITIAL PAYMENT FOR FRESHMEN

The initial payment required of freshmen at the time of fall registration is indicated below and is made up of the following items:

Tuition (citizens of Massachusetts)	\$50.00
Room rent (dormitory) (approximately)	75.00
Board (University Dining Hall)	170.00
Military Uniform (men students)	30.00
Student Tax	20.00
Books, Stationery, etc.	45.00
	\$390.00

The above are only approximate figures. A bill will be rendered to the parent of each student prior to the opening of the University.

TUITION.—As a state institution the University of Massachusetts offers a low rate of tuition to all students entering from the Commonwealth. Eligibility for admission under the low residential rate is determined in accordance with the following policy established by the Board of Trustees.

A student must present evidence satisfactory to the Treasurer of the University that his domicile is in the Commonwealth of Massachusetts in order to be considered eligible to register in the University as a resident student. This means that he must have established a *bona fide* residence in the Commonwealth with the intention of continuing to maintain it as such.

The domicile of a minor shall follow that of the parents unless such minor has been emancipated. In case of emancipation the student, in addition to the requirements of these regulations respecting residence, shall present satisfactory proof respecting emancipation. Minors under guardianship shall be required to present, in addition to the certification of the domicile of the guardian, satisfactory documentary evidence of the appointment of the guardian.

No student shall be considered to have gained residence by reason of his attendance in the University nor shall a student lose residential preference during his continuous attendance at the University.

The residence of a wife shall follow that of the husband.

The prescribed form of application for classification as to residence status must be executed by each student. Misrepresentation of facts in order to evade the payment of out-of-state tuition shall be considered sufficient cause for suspension or permanent exclusion from the University.

Discretion to adjust individual cases within the spirit of these rules is lodged with the President of the University.

BOARD.—The University provides three dining halls where students may board. These are located in Butterfield dormitory, in Greenough dormitory, and in Draper Hall.

The dining halls in Butterfield and Greenough dormitories are intended primarily for the students who are residents of the dormitories in that section of the campus. Draper Hall is the dining commons for all other students. Service is on a cafeteria plan.

Students may purchase coupon books that provide full-time board at the rate of approximately ten dollars per week, or meals may be paid for on an individual basis as they are taken. Rate is subject to change.

MILITARY UNIFORM.—All students taking military drill are required to make a deposit of \$30 for the uniform. A rebate of this amount is made when the uniform is returned.

STUDENT ACTIVITY TAX.—This tax, authorized by vote of the undergraduate students with the approval of the Board

of Trustees, provides each student with the Collegian, the student newspaper; Index, University annual; Social Union privileges, student government, class and other activities.

ADVANCE PAYMENT

New students will be expected to make an advance payment of \$15 to the Treasurer of the University as soon as they are notified by the Registrar that they are accepted for admission. This will be considered as first payment on registration fees which will be due at time of matriculation in September. It is not refundable and will be considered as payment for admissions and registration expense if the student does not matriculate.

REFUNDS

A student who leaves the University for any reason before a semester is half completed will have refunded to him one-half the fees paid for that semester, but one who leaves after a semester is half over will be allowed no rebate of fees. There will be no refund of prepaid rent.

WHEN PAYMENTS ARE DUE

In accordance with policy established by the Board of Trustees, all charges for tuition, fees, board, and room rent in University dormitories are due at the beginning of each semester and must be paid on or before the opening date of each semester. Bills will be rendered in advance, and payment may best be made by mail. Students may not attend classes until registration charges are paid.

LATE REGISTRATION

Any student who does not complete his registration, including payment of semester charges on the regular registration days will be required to pay a fine of five dollars.

FINANCIAL REQUIREMENTS FOR GRADUATION OR HONORABLE DISMISSAL

Diplomas, transcripts of record, and letters of honorable dismissal will be withheld from all students who have not paid all bills and all loans due the University or all legitimate bills for room rent and board due fraternities or private individuals. All such bills due the University must be paid ten days preceding Commencement. If paid after that date and the student is otherwise eligible, he may graduate the following year.

Private creditors of students must present itemized statements of charges to the Treasurer of the University at least 15 days before graduation if they wish to have their claims recognized by the University.

FINANCIAL AID

Scholarships, loans, and part-time employment are available for a limited number of needy and deserving students.

AID FOR FRESHMAN YEAR.—Freshmen are eligible for scholarships and part-time employment. A freshman also becomes eligible for assistance from loan funds after satisfactorily completing one semester of academic work. Scholarship application blanks may be secured from the Registrar and should be filed by May 1. Part-time employment application forms may be obtained from the Director of Placement Service and filed after a candidate has been accepted for admission.

Because of the time required for preparation of studies, few students should plan to spend more than ten hours per week in part-time employment.

AID FOR UPPERCLASSMEN.—To become eligible for financial assistance, whether scholarship, loan, or part-time employment students must file completed financial aid application forms with the Student Aid Committee in the Placement Service office by June 1 previous to the college year for which assistance is asked.

SCHOLARSHIPS

Scholarships are awarded only to needy and deserving students of high character whose habits of life are economical and whose scholastic records are satisfactory. A limited number of these scholarships are available for entering freshmen.

Scholarships are paid in installments at the beginning of each semester in the form of a credit on the student's bill. A scholarship may be discontinued at the close of any semester if the scholastic record of the recipient is unsatisfactory.

If a scholarship student withdraws from the University, any refund of University fees or charges must first be applied to reimburse the scholarship fund for the full amount of the scholarship received by the student for the semester.

The following scholarships are available:

ALVORD DAIRY SCHOLARSHIP.—for a worthy student specializing in the study of Dairy Husbandry with the intention of becoming an investigator, teacher or special practitioner in connection with the dairy industry.

DANFORTH KEYES BANGS SCHOLARSHIP.—for the aid of industrious and deserving students.

CHI OMEGA AWARD.—The local chapter of the Chi Omega Sorority offers an annual scholarship of twenty-five dollars to that woman student majoring in the department of economics or psychology who has the highest scholastic average at the end of the first semester of the senior year.

- LUCIUS CLAPP FUND.**—to provide scholarships and loans to deserving students.
- CLASS OF 1882 SCHOLARSHIP.**—for the aid of a worthy student of the junior or senior class.
- FREDERICK G. CRANE SCHOLARSHIPS.**—for the aid of worthy undergraduate students, preference being given to residents of Berkshire County.
- J. D. W. FRENCH SCHOLARSHIPS.**—for deserving students in dairying and allied subjects; also Forestry.
- HENRY GASSETT SCHOLARSHIP.**—for a worthy undergraduate student.
- CHARLES A. GLEASON SCHOLARSHIPS.**—general scholarship for worthy students.
- CHARLES H. HOOD DAIRY SCHOLARSHIPS.**—An unusual grant of \$400 for two scholarships to be awarded to seniors whose ultimate object is the operation of their own dairy farms.
- LOTTA SCHOLARSHIPS.**—The Trustees of the Lotta Crabtree Agricultural Fund have made available a substantial sum for scholarships. These are limited to students registered in the Schools of Agriculture, Home Economics, Horticulture and Science. One-fourth of the amount granted is awarded to freshmen.
- MARGARET F. MOTLEY SCHOLARSHIP.**—one scholarship of \$100 for an upperclass student studying Horticulture, Landscape Architecture or Floriculture.
- PORTER L. NEWTON SCHOLARSHIPS.**—for the aid of worthy and deserving students in the field of agriculture.
- BETSEY C. PINKERTON SCHOLARSHIPS.**—two general scholarships for graduates of the schools of the city of Worcester.
- SEARS SCHOLARSHIPS.**—The Sears Roebuck Company provides for eight scholarships of \$125 each which are awarded annually to deserving students in the freshman class who desire to major in agriculture.
- WHITING STREET SCHOLARSHIPS.**—Scholarships of fifty dollars each for deserving students.
- HELEN A. WHITTIER SCHOLARSHIP.**—for a deserving woman student in art as applied to living.

There are also the following special scholarships:

- COTTING MEMORIAL SCHOLARSHIP.**—all college expenses of freshman year—for a woman student. Recipient of this scholarship is selected by a committee of the New England Branch of the Farm and Garden Association from among candidates proposed by State Leaders of 4-H Club work in the New England states.
- WILBUR H. H. WARD SCHOLARSHIPS.**—Twenty-five scholarships of approximately \$100 known as the Wilbur H. H. Ward Scholarships. The Wilbur H. H. Ward Fund is administered by a Board of Trustees independent of the University. Applicants for these scholarships should write

to Sumner R. Parker, who may be addressed at the University. They are available only to Hampshire County boys.

WOMEN'S STUDENT GOVERNMENT AWARD.—An award by the Women's Student Government Association to a young woman student at the end of her junior year. This award is made on the basis of character and personality, scholastic achievement, campus influence and service.

GEORGE L. FARLEY SCHOLARSHIPS.—The Massachusetts Society for Promoting Agriculture has established a scholarship in memory of George L. Farley. The income of approximately \$60 per semester is awarded to deserving 4-H Club members, men or women, recommended by the State Leader of 4-H Clubs from applications submitted to County 4-H Club Agents.

Esso 4-H SCHOLARSHIP.—The Colonial Beacon Oil Company, each year, awards a \$400 scholarship payable \$100 per year to a 4-H Club member enrolled in some course related to agriculture. Selection is on the basis of need, merit and ability. Application should be sent to County 4-H Club Agents.

THE BORDEN COMPANY FOUNDATION.—Provides an annual Scholarship Award of \$300 to that senior student in Agriculture who has achieved the highest average grade in all college work preceding the senior year. No student whose curriculum did not include at least two courses in Dairy subjects is eligible.

NEVILLE STURGIS SCHOLARSHIPS.—The income from a trust set up under the trusteeship of DeBlois and Maddison by Neville Sturgis of Weston, amounting to approximately \$1700 annually. This income is to be used in aiding deserving undergraduate students of the University.

ASCENSION FARM SCHOOL SCHOLARSHIPS.—The trustees of the Ascension Farm School offer annually approximately \$2400 for scholarships. These are restricted to men from Western Massachusetts who are studying in the fields of Agriculture and Horticulture.

LOANS

Through the generosity of friends of the University, funds have been donated to provide loans for a limited number of students of the three upper classes to assist in paying tuition or other college expenses. These loans are granted, after proper consideration, to needy students of good scholarship whose habits are economical. All loans are secured by a note endorsed by a responsible party as collateral. All such loans must be paid before graduation. Upon withdrawal from the University, loans automatically become due. Interest is charged at the rate of 3% to maturity, 5% thereafter on loans from all funds except the Lotta Agricultural Fund, from which loans are made without interest.

Application for loans should be made to the Student Aid Committee, Placement Service Office, South College. No loan will be granted in excess of \$150 in any one year.

If funds are available at the beginning of the second semester, loans may be made in exceptional cases to members of the Freshman class whose scholastic record is satisfactory and whose budget calculations have been upset through circumstances beyond their control.

DANFORTH KEYES BANGS FUND.—This is a gift of \$6,000 from Louisa A. Baker of Amherst, the income of which is used in aiding poor, industrious and deserving students to obtain an education in the University of Massachusetts.

LOTTA AGRICULTURAL FUND.—A limited number of loans are made to students from the income of this fund. Such loans are made without interest but only to deserving students of high scholastic rank. This fund is administered by a Board of Trustees independent of the University although loans are made only upon the recommendation of the President of the University.

VINCENT GOLDTHWAIT MEMORIAL LOAN FUND.—A gift of \$5,000 from Dr. Joel E. Goldthwait in memory of his son. This fund is used almost entirely for students in the Stockbridge School of Agriculture.

FRANK A. WAUGH FOUNDATION.—Graduates of the Department of Landscape Architecture and friends of Professor Frank Waugh have established this fund, to be used in part for loans to deserving seniors and fifth year students of that department. Requests for loans shall be reviewed and approved by the head of the department of Landscape Architecture and submitted to the Board of Trustees of the Foundation, who shall make final decision as to granting of the loans and amounts thereof.

4-H SCHOLARSHIP AND LOAN FUND.—This fund is under the supervision of the State Leader of the 4-H Clubs and is used to aid students preparing for agricultural and home economics service.

NATIONAL PEST CONTROL ASSOCIATION LOAN FUND.—A fund established by the National Pest Control Association for needy students in the field of Entomology.

PART-TIME EMPLOYMENT

The Placement Service is the clearing center for all part-time jobs of the University. Students are assisted in obtaining part-time work during the College year and full-time work during the summer vacation. Employment is not guaranteed but every effort is made to help those students who must work to meet their college expenses. This Office also maintains a Placement Service for graduates of the University.

In order to give assistance to as many needy students as possible, the Student Aid Committee has adopted the policy of limiting the maximum financial aid per student to the equivalent of board, or approximately \$300. The average earnings of students engaged in part-time work is approximately \$100 per student per year.

Personnel of the Placement Office also act in an advisory capacity for students studying under the provisions of Public Laws 16 and 346. Veterans enrolled under these laws file their Eligibility certificates with the Placement Office and may obtain recommendations concerning their transactions with the Veterans Administration.

STUDENT LIFE AND WELFARE

HEALTH SERVICE

The University endeavors to safeguard the health of all students while on the campus and for this purpose maintains a Department of Student Health staffed by two physicians and four resident registered nurses, and a group of three infirmary buildings.

- (1) Physical examination by the Health Service is required of all entering freshmen, reentering students, and all students participating in athletics. This examination is given to freshmen during matriculation week. Evidence of a SUCCESSFUL small-pox vaccination is required.
- (2) The Student Health physicians have offices in the Physical Education Building and in the out-patient Infirmary Building, where they may be consulted during college hours.
- (3) The Infirmary consists of 3 buildings, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by one of the Student Health physicians.
- (4) The students are urged to consult the resident physicians at the first sign of physical disorder, or even for minor accidents. Many severe illnesses and much lost time may be avoided by early or preventive treatment.
- (5) No charge is made to Infirmary bed patients for the first seven days in the school year; time in excess of seven days will be charged at the rate of \$4 per day. A nominal charge may be made to out-patients for miscellaneous treatments.
- (6) In addition to the fee charged as specified in paragraph 5, the following additional expenses will be charged to the patient.
 - (a) *Nurses*.—If a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient.

Such a nurse will be under the general supervision of the resident nurse.

- (b) *Professional Service*.—If a student requires continuous medical attention by a physician, he may be required to select a town physician and become responsible for fees charged by that physician.
 - (c) *Supplies*.—Special medical supplies prescribed by a physician will be charged to the patient.
 - (d) *Laundry*.—Expenses for personal laundry incurred by students while in the infirmary will be charged to the individual student.
- (7) The Health Service recommends strongly that students participate in the blanket insurance program described in literature accompanying the initial bill rendered students each year.

STUDENT HOUSING

It is the policy of the Board of Trustees that freshmen men and women students shall be housed in campus dormitories and be required to eat at University Dining Halls unless given permission to commute. Sophomore and upper-class students will also be required to live in University dormitories in so far as accommodations are available. Those who cannot be so housed will be given permission to live in fraternity or sorority houses or in private homes.

Students who are assigned to housing operated by the University, or homes approved by the University, are expected to occupy them for the entire school year and may not be released sooner except as their places are taken by suitable substitutes.

Dormitories will be open for occupancy on Sunday at 1:00 P.M. preceding the opening of the University.

Rooms are furnished except for necessary bedding and linen and are cared for by the students occupying them. Each occupant is held responsible for any damage done.

All student property must be removed from the rooms and key turned in to the Treasurer's Office immediately after final examinations in June. Such property not removed by the owner will be removed by the University and stored at the owner's expense.

The general supervision of the housing conditions of all students is in charge of the Faculty Committee on Housing.

ROOMS FOR WOMEN STUDENTS.—Dormitory rooms are available for women students at Lewis and Thatcher Halls and Abigail Adams House.

Under the supervision of the Dean of Women, life in each dormitory is directed by a council of student leaders, advised by a full-time Housemother, so that conditions in the residence

hall are conducive to study and good living habits. Through Women's branch of the Student Government, the responsibility is put upon each student to live according to her own best standards as well as according to the standards of the group.

Freshmen girls will be assigned rooms in the dormitories and will be notified of the assignment prior to the beginning of college.

Near the close of each year, Sophomores and upperclass women will draw numbers to determine the order in which rooms may be chosen for the coming year.

The Dean of Women may permit students to live off-campus for the reason that they wish to live at home, or in a sorority house, or that they have an opportunity to earn room and board in a private home.

ROOMS FOR MEN STUDENTS.—Dormitory rooms are available for men students at Butterfield House, Mills House, Greenough and Chadbourne Halls, Berkshire, Plymouth, and Middlesex Houses, Commonwealth Circle, and other new dormitories.

All first year men students will be assigned to campus dormitories. Upperclassmen should make dormitory room reservations at the Housing Office before May 1. Those who cannot be accommodated in dormitories, will be given permission to live in fraternities or private homes. Assignment of dormitory rooms will be under the supervision of the Housing Office.

ROOMS FOR MARRIED STUDENTS.—The University cannot guarantee facilities for married students. However, those married students who can be accommodated will be housed in Federal Circle or the University Apartment Units. Assignments are under the direction of the Housing Office and all inquiries should be addressed to that office. Some students may be able to locate rooms or apartments off-campus.

ADVISORY SYSTEM

In order that from the day he enrolls the freshman may have some one to whom he can go for consultation and assistance, each student, at the time of registration, is assigned to a faculty adviser. It is the function of this adviser to help the student in adjusting himself to the work and life of the University. Academic progress reports, issued by the Registrar's Office, are sent to the advisers periodically, and the students are expected to report to their advisers from time to time to discuss their academic standing. The adviser also forwards reports of academic standing to the parents. Both students and parents are encouraged to consult with the adviser whenever there are problems regarding studies or personal adjustment to college life.

At the beginning of the second semester of the freshman year each student will discuss his vocational and

specialization plans with his adviser. If he can decide definitely upon the department in which he wishes to specialize, and the adviser approves, the student takes his election card to the head of that department for approval. In cases where students are not ready to designate a department of specialization they continue as general majors during the sophomore year under the direction of an adviser assigned by the head of the School in which the student is enrolled. Such general majors must select their field of specialization by the end of the sophomore year.

During the junior and senior years the student is under the guidance of the head of the department in which he is majoring or an adviser assigned by him.

RELIGIOUS LIFE

The University makes an effort to provide a wholesome and stimulating spiritual atmosphere for its students by co-operating with official agencies of the three faiths most largely represented at the University.

On the campus the religious life of Catholic students is enriched by the Newman Club, of which Father David J. Powers of Saint Brigid's Parish is chaplain; Jewish students may participate in services and activities at the local Hillel House, under the chaplaincy of Rabbi Louis Ruchames of Northampton; and Protestant students may join in worship and other religious activities conducted by the Student Christian Association, under the guidance of the Reverend Arnold M. Kenseth, full-time chaplain to Protestant students.

In town, the churches of Amherst provide not only the usual opportunities for worship and participation in church work, but special events for students. Students are particularly encouraged to attend Sunday service in the local churches of their respective faiths.

STANDARDS OF DEPORTMENT

The customary high standard of college men and women in honor, self-respect and consideration for the rights of others constitutes the ideals of student deportment.

The privileges of the University may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the University, acting through its President, or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which they may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as student be not affected. The same provision applies equally to the matter of absences. According to the rules, juniors and seniors are allowed a certain percentage of absences from class and other exercises.

This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet if, in the judgment of the University authorities, a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

Hazing in the sense of the punishment or humiliation of students is not permitted.

ACADEMIC REGULATIONS

FRESHMAN WEEK

All members of the incoming freshman class are required to be in residence on the campus for the period known as Freshman Week. During this period an attempt will be made to orient the student. He will be given psychological and mental tests, and a physical examination. Schedules and section assignments will also be arranged. In addition there will be lectures on student activities, customs, and curricula, and a scheduled meeting with the student's adviser.

REGISTRATION

Every student must report for registration on the appointed day. All late registrants must pay a \$5.00 fine. No student will be admitted to any class until he has completed the prescribed registration procedure. Changes of courses on the registration card shall be made only by the Registrar's Office.

No course will be recorded on the permanent records of the University nor will a student receive credit for it, unless such course appears on the registration card for the semester and has been properly countersigned by the instructor.

ADDING OR DROPPING COURSES

A student may not add or drop a course except with the approval of the Registrar. A course dropped without approval will be recorded as a failure.

CHANGE OF MAJOR

A student wishing to change his major must get a Change of Major card at the Registrar's Office. This change is to be approved by the head of the Department or School in which he is now majoring and also by his new major adviser. This card, properly indorsed, must be returned to the Registrar's Office before the change receives final approval.

MARKING SYSTEM

All grading is done on a numerical basis with 60 per cent the passing grade. A student whose daily work in any course is entirely unsatisfactory will not be permitted to take the

final examination in the course and is automatically failed. If he takes the final examination and fails to pass, the instructor may report either a condition (‡) or failure (F). To remove a condition, the student will have an opportunity to take a condition examination or he may repeat the course. A failed course must be repeated unless permission to substitute another course is granted by the Committee on Scholarship.

The scholastic record of each student is reported to his parents at the end of each semester. Mid-semester marks are sent to parents for the first semester only. A complete report of the scholarship record of each student during his first semester is sent to the principal of the school from which the student entered.

TRANSCRIPTS

Two transcripts of a student's record will be furnished without cost. For each three additional copies there will be a charge of one dollar.

CONVOCATIONS

Throughout the year each School and Division of the University conducts convocation programs which are especially designed to give students opportunities of hearing from leaders in Science, Art, Government, Education, etc. Some of the convocations are devoted to student activities such as debates, declamation contests, band and musical concerts.

STUDENT ORGANIZATIONS

One of the values received from the University course is the training one acquires through participation in student activities. Student organizations offer excellent opportunities for development of leadership and broadening of outlook.

STUDENT GOVERNMENT

The student Senate operating under the student constitution and composed of elected representatives from the student body is the governing council of undergraduates. Its aim is to promote the general welfare of the University and, in doing so, groups of both students and faculty meet to further their mutual interests. The student Senate directs student conduct and represents the interests of the student body before the faculty.

ACADEMIC HONOR SOCIETIES

PHI KAPPA PHI.—The Massachusetts Chapter of the Honor Society of Phi Kappa Phi was installed on the campus in 1904. Its prime object is to emphasize scholarship and character. Senior students from all departments of the University are eligible for election to membership provided the scholastic and character requirements of the Society are met.

SIGMA XI.—The Society of Sigma XI is a scientific fraternity to which members are elected on the basis of outstanding scientific research. The local chapter was established in 1938.

STUDENT HONORARY SOCIETIES

ADELPHIA.—A men's senior honorary society, recognizing men students who have been prominent in the extra curricular activities of the campus.

ISOGEN.—A women's senior honorary society. Its purpose is to recognize outstanding women students on the campus.

FRATERNITIES AND SORORITIES

Social fraternities on the campus include Alpha Epsilon Pi, Alpha Gamma Rho, Kappa Sigma, Lambda Chi Alpha, Phi Sigma Kappa, Q.T.V., Sigma Alpha Epsilon, Sigma Phi Epsilon, Tau Epsilon Phi, and Theta Chi. An Inter-Fraternity council, consisting of representatives of these fraternities, has charge of rushing and all general matters dealing with fraternity life.

Sororities include Chi Omega, Kappa Alpha Theta, Kappa Kappa Gamma, Pi Beta Phi, Sigma Delta Tau, and Sigma Kappa. The Pan-Hellenic Council, made up of representatives from the sororities, supervises rushing and other sorority matters.

ACADEMIC ACTIVITIES

THE COLLEGIAN.—This is a weekly newspaper published by undergraduates.

THE QUARTERLY.—A magazine in which the literary and artistic efforts of the students are published.

INDEX.—The Year Book.

UNIVERSITY HANDBOOK.—Published annually as a campus book of reference.

The University Musical Clubs include an orchestra, a band, and men's and women's glee clubs. These make various public appearances during the school year both on and off campus.

The Dramatic Club, the Roister Doisters, presents three productions each season. The women's Drill Team accompanies the band at all home football games. All academic activities are supervised by the Academic Activities Board composed of alumni, faculty, and students, and find recognition in the annual award of gold and silver medals.

INTER-COLLEGIATE ATHLETICS

The University is represented in inter-collegiate athletics by teams in all the leading sports, including football, baseball, track, hockey, soccer, swimming and basketball. General policies governing athletics are directed by the Athletic Board, composed of alumni, faculty, and students.

PROFESSIONAL CLUBS

There are numerous professional clubs established in connection with the various major courses of study. These clubs stimulate the students' professional interest in their chosen subject-matter fields and afford opportunity for discussion of technical subjects of mutual interest.

HONORS, PRIZES, AWARDS

SCHOLARSHIP HONORS

DEAN'S SCHOLARSHIP GROUPS.—At the beginning of each semester a list is posted of those students who during the previous semester made a general average of 80 per cent or better. Three groups are recognized: those between 90 and 100; those between 85 and 90; and those between 80 and 85. Sophomores, juniors and seniors in the first two groups are allowed considerable freedom in the matter of class attendance.

DEPARTMENTAL HONORS.—A student who has shown outstanding promise within some department and has maintained a general scholastic average of 80 percent or better is permitted to apply for the privilege of registering for departmental honors. If his application is accepted by his department and the Honors Committee, he is allowed to pursue a course of independent study within the department of his choice throughout his senior year. This may include intensive reading, investigation or laboratory work in connection with some problem that he chooses for his consideration. The objective is to create on the part of the student initiative, the power of independent investigation and to develop in him the spirit of research. Although the student is responsible for his undertaking he is encouraged to consult with his department in regard to his work should the need arise. At the close of his study the student presents a thesis covering his investigation. In addition he may be required to appear for an oral or written examination. If by the excellence of his work he satisfies all the requirements of his department and the Honors Committee, his name will appear on the commencement program as receiving honors in the field of his specialization.

SCHOLASTIC PRIZES

PHI KAPPA PHI AWARD FOR SCHOLARSHIP.—Massachusetts Chapter of the Phi Kappa Phi, honorary scholarship society, offers an award of \$50 for outstanding work in scholarship. This is given to some member of the senior class at the opening of school in the fall. The award is based on the record of the first three years.

THE BURNHAM PRIZES.—These were made possible through the generosity of Mr. T. O. H. P. Burnham of Boston. Prizes of \$15 and \$10 are awarded to those students

delivering the best and second best declamations in the Burnham contest. The preliminary contests are open under certain restrictions to freshmen and sophomores.

THE FLINT PRIZES.—The Flint Oratorical Contest was established in 1881 by a gift of the late Charles L. Flint, a former president of the College. After his death the prizes were continued by college appropriation. Prizes of \$30 and \$15 are awarded as first and second prizes to those two students delivering the best orations in this contest.

THE HILLS BOTANICAL PRIZE.—This is given through the generosity of Henry F. and Leonard M. Hills of Amherst, for the first and second best herbaria. Competition is open to members of the senior, junior and sophomore classes. First prize \$20, second prize \$15.

THE BETTY STEINBUGLER PRIZE IN ENGLISH.—This prize was endowed by John L. Steinbugler, New York City, in honor of his daughter Elizabeth Steinbugler Robertson, a graduate of this College in 1929. It is awarded to a woman in the junior or senior class who has written the best long paper on a subject of literary investigation in a course in English during the year.

MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE PRIZES.—Three prizes of \$25, \$15, and \$10 to be awarded to those senior students who are judged to have made the best records in the theoretical and practical work in agriculture required in their course of study, and in the special written and oral examination prepared for the purpose of this award.

ATHLETIC AND ACADEMIC PRIZES

THE ALLAN LEON POND MEMORIAL MEDAL.—This medal is awarded for general excellence in football in memory of Allan Leon Pond of the class of 1920, who died February 26, 1920. He was a congenial companion, a devoted lover of Alma Mater, a veteran of World War I, a fine all-round athlete and a true amateur. He would rather win than lose, but he would rather play fair than win. He has been characterized as a typical student of this College.

THE WILLIAM T. EVANS MEMORIAL TROPHY.—This trophy is given each year to that member of the varsity football team who through his sportsmanship, football ability, character and personality, has thus exemplified the character and spirit of the person in whose memory this memorial trophy is dedicated. The trophy is dedicated to the memory of William T. Evans, a former member of the class of 1942, who died December 9, 1941. This trophy is presented annually by the class of 1942.

THE THOMAS E. MINKSTEIN MEMORIAL AWARD.—This award is made by the class of 1931 in memory of their classmate who died July 16, 1930 while he was captain-elect of football. The award is given to one of the outstanding men

in the Junior Class who has as nearly as possible attained those standards of athletics, scholarship and leadership set by him whose memory this award honors.

THE GEORGE HENRY RICHARDS MEMORIAL CUP.—This cup is awarded annually to the member of the basketball team who shows the greatest improvement in leadership, sportsmanship, and individual and team play during the year. It is in memory of George Henry Richards of the Class of 1921 who died suddenly while a student at the College.

THE JOSEPH LOJKO MEMORIAL PLAQUE.—This plaque is presented to a senior who must be a letter man, have a satisfactory scholastic record and show those qualities of enthusiasm and cooperation which make for leadership. An award in honor of Joseph Lojko of the Class of 1934, outstanding athlete who died while a senior in the College.

THE SAMUEL B. SAMUELS BASKETBALL CUP.—This cup is presented annually in the name of Samuel B. Samuels of the Class of 1925 who was an outstanding basketball player during the early years of basketball as a varsity sport at the University. The trophy is awarded to that letter man who is a regular member of the varsity basketball team and who has performed with excellence during scheduled varsity games.

THE E. JOSEPH THOMPSON MEMORIAL TROPHY.—This baseball trophy is given by Thomas Thompson in memory of his brother E. Joseph Thompson who graduated from Massachusetts State College in 1932. He was president of the Student Senate, a varsity letter man in football and baseball, and an outstanding campus citizen. The award goes to that member of the varsity baseball team who best exemplifies the best characteristics of the sport each year.

ACADEMICS CONSPICUOUS SERVICE TROPHY.—This trophy is awarded annually to that student who has made the most unique contribution to the Academic Activities during the year.

ACADEMIC MANAGER'S PRIZE.—Fifty dollars awarded annually to that Academics manager who fulfills his routine duties most efficiently.

MILITARY HONORS AND AWARDS

Competed for yearly and presented at the Final Military Review.

SENIOR CLASS

DESIGNATION OF DISTINGUISHED MILITARY GRADUATES.

THE SONS OF THE LOYAL LEGION TROPHY.—Awarded annually by the Massachusetts Chapter of the Sons of the Loyal Legion to the senior cadet ranking No. 1 for the year in Military Scholarship and Efficiency. Winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

JUNIOR CLASS

THE MASSACHUSETTS CHAPTER RESERVE OFFICERS ASSOCIATION TROPHY.—Awarded annually by the Massachusetts Chapter ROA and the Springfield Chapter ROA to the junior cadet ranking No. 1 in Military Scholarship and Efficiency. A plaque with winner's name engraved thereon is awarded by the Massachusetts Chapter ROA, and a sterling silver goblet, donated and presented by the Springfield Chapter ROA, is given to the individual to keep in his permanent possession.

THE AIR FORCE ASSOCIATION MEDAL.—Awarded by the Air Force Association to the outstanding Air ROTC cadet in the First Year Advanced Course. This award is based on academic and military scholarship grades and individual characteristics of leadership.

SOPHOMORE CLASS

THE ELIZABETH L. McNAMARA TROPHY.—Awarded annually by Mrs. Elizabeth L. McNamara, a trustee of the University for many years, to the cadet ranking No. 1 in scholarship and military efficiency in the second year basic course. Award consists of a permanent plaque with winner's name inscribed thereon.

THE JOHN C. HALL TROPHY.—Awarded annually to the cadet ranking No. 1 in scholarship and military efficiency in the second year basic course. Award consists of a loving cup donated by the class of '02 with the winner's name inscribed thereon, and a sterling silver goblet awarded by Mr. John C. Hall is given to the individual to keep in his permanent possession.

FRESHMAN CLASS

THE AMHERST ROTARY CLUB TROPHY.—Awarded annually by the Amherst Rotary Club to the cadet ranking No. 1 in Scholarship and military efficiency in the first year basic course. Winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

OTHER AWARDS

THE MILITARY DEPARTMENT TROPHY.—Awarded annually to the cadet of any class who has been of the most value to the Cadet Corps during the past year. Award consists of a sterling silver goblet appropriately engraved, which is given to the individual to keep in his permanent possession.

THE BRIDGMAN TROPHY.—Awarded by Mr. E. F. Bridgman to the member of the Rifle Team with the highest average score for the season. Award consists of a sterling silver goblet appropriately engraved, which is given to the individual to keep in his permanent possession.

QUALIFICATION BADGES U.S. ARMY.—Awarded to cadets who have qualified with the necessary scores with either Rifle or Pistol.

ALUMNI ASSOCIATION

The Associate Alumni is the general organization of the Alumni, men and women, of the University of Massachusetts. The association maintains headquarters at Memorial Hall, erected by Alumni and friends in honor of those men of the University who died in World War I.

It publishes a monthly Bulletin as the alumni publication of the University and, periodically, an Alumni Directory.

The Associate Alumni strives to advance the interests and welfare of the University of Massachusetts in every way possible, and cooperates in its educational work.

The organization is presently engaged in extending the facilities of Memorial Hall, as a memorial to those men who died in World War II.

Under alumni sponsorship, eight self-liquidating dormitories have been built or are being built on campus.

The governing body of the Associate Alumni consists of its officers and a Board of Directors. Four directors are elected each year and serve a term of four years. All graduating seniors become members of, and contributors to, the Association at graduation according to a tradition set by the Class of 1940.

ADMISSION TO THE UNDERGRADUATE COLLEGE

Those interested in applying for admission to the University of Massachusetts should write to the Registrar to obtain an application form. The first two pages of the application form are completed by the candidate himself. The second two are completed by high school or preparatory school authorities who mail the application form directly to the Registrar of the University. Because of the increasing interest in college level study and the consequent increase in the number of applications, candidates are advised to file their applications at least before March 1st of the year in which they plan to enter.

Preference is given to residents of Massachusetts but the University also admits students from other States. A few students from foreign nations are also admitted. Candidates for the freshman class are accepted only for the opening of the college year in September. Students enrolled in other colleges may apply for admission to the Summer Session, but admission to the Summer Session does not necessarily constitute regular admission and enrollment in the undergraduate program of the University.

The University admits young men and women to the freshman class chiefly on the basis of character and scholarship. High school graduation alone is not sufficient. The general record must indicate promise of success and ability to profit by the opportunities which the University has to offer. Due regard is given to special achievement in specified subject matter fields.

SUBJECT REQUIREMENTS FOR ADMISSION

The subjects of preparatory study required for admission call for the satisfactory completion of a four-year high school course or its equivalent and are stated in terms of units. A unit is the equivalent of at least four recitations a week for a school year. High school graduation alone is not sufficient. The applicant's record must indicate capacity for handling the quality of scholastic work which the University has established as its standard of achievement.

Sixteen units of secondary school work must be offered, selected according to the following requirements:

Algebra	1½
Plane Geometry	1
English	4
Foreign Language (2 years of 1 language)	2
U.S. History	1

The remaining units are elective and may be selected from the following subject matter:

- a. Mathematics
- b. Science
- c. Foreign Language
- d. History and Social Studies
- e. Free electives (not more than four units)

Free elective subjects are those not included in groups a-d, as for example: Music, Art, Drawing, Typewriting, Aeronautics, Agriculture, Home Economics, etc. Such free electives are allowed in order that the student who wishes may have some opportunity to elect among other high school offerings, while at the same time covering the fundamental requirements for college work.

Students planning to pursue an engineering curriculum should offer two years of Algebra, one of Plane Geometry, and one-half year each of Trigonometry and Solid Geometry. Chemistry and Physics are also advised. Those deficient in the Mathematics should plan to cover it during the summer prior to entrance or expect to take five years to complete the college course.

In high schools organizing agricultural club work under the supervision and rules of the Junior Extension Service of the University, one credit is granted for each full year of work approved by the State Leaders.

Candidates of exceptional ability and promise may be considered for admission even though all the prescribed courses were not included in their high school program.

METHODS OF ADMISSION

Plan A. Students applying from accredited schools and making the college recommendation grade of their school in accordance with the subject requirements listed above are considered certified for admission.

In some cases applicants will not be fully certified. In such instances, the Admissions Committee will give a candidate the choice of taking certain entrance examinations offered by the University or the College Board Scholastic Aptitude and Achievement Tests as described under Plan B. Applicants are advised to file their applications early, therefore, in order that they may know well in advance what further must be done to qualify for enrollment.

Superior graduates of Vocational Schools of Agriculture in Massachusetts and Vocational Agricultural Departments in Massachusetts High Schools may be accepted for the Degree of Bachelor of Vocational Agriculture provided:

- a. They are unqualifiedly recommended by the Vocational Division of the Department of Education as bona fide Vocational Graduates with superior ranks; and

b. That they can present at least 16 units of certified entrance credits, approved as to quality and quantity by the State Department of Vocational Education.

Plan B. Under this plan a student's qualifications will be based upon his school record and the results of the Scholastic Aptitude Test and three Achievement Tests of the College Entrance Examination Board. Candidates will ordinarily take these examinations either in April or June of their senior year. Application blanks and a bulletin of general information may be secured from the College Entrance Examination Board, P.O. Box 592, Princeton, New Jersey.

The University realizes that though almost all students will qualify under either Plan A or B, there will be a few promising candidates who, for one reason or another, are unable to meet fully the subject requirements for enrollment. Such applicants are requested to present their individual problems to the Registrar in order that the Admissions Committee may outline for them what must be done to qualify for enrollment.

ADMISSION TO ADVANCED STANDING

A limited number of students from approved colleges may be admitted on transfer to advanced standing. Since applicants for such admission usually exceed the number that can be accepted, they are placed on a competitive basis. Acceptance will thus depend upon recommendations and quality of record.

Candidates desiring to transfer to the University of Massachusetts from other institutions should write to the Registrar for a regular application form, inasmuch as a student applying for transfer must first of all be able to meet the entrance requirements of the University. Such candidates should also submit the following:

a. A letter outlining reasons for wishing to transfer and describing briefly the type of major work to be followed if accepted for admission.

b. An official transcript of entrance credits and college record to be sent by the Registrar of the College attending. This should be forwarded as soon as possible after the close of the semester preceding the one for which transfer is sought.

At the time he is notified that he can be accepted for admission the student will be given a tentative statement of the amount of transfer credit he will receive. This credit will be finally determined, however, after he has spent a year at the University and his scholarship has been thoroughly tested.

At least one consecutive year of work in residence is required of any transfer student desiring to be recommended for the Bachelor's degree.

SCHOOLS AND DIVISIONS OF INSTRUCTION

Resident instruction is organized on a school and divisional basis. In the undergraduate college there are seven schools and two divisions. The schools are: School of Liberal Arts, School of Science, School of Horticulture, School of Home Economics, School of Engineering, School of Agriculture, School of Business Administration.

The Divisions are Physical Education and Military Science.

This section of the catalogue presents the opportunities for study in these schools and divisions, and describes the curricula available in each. Brief descriptions are given of the major work offered in the several departments and the special curricula which cut across departmental lines. The adviser in charge of each major is indicated. This adviser will aid the student in planning his program of studies and give him more complete information in regard to the qualifications for and opportunities in his particular field. For a description of specific courses refer to the Directory of Courses.

REQUIREMENTS FOR GRADUATION

At the beginning of his freshman year each student selects a school or division in which he will carry his major work. One of the fundamental objectives of all programs, however, regardless of School, is a general cultural education which should be the mark of every college graduate. With this end in view all candidates for the B.S. or A.B. degree must take certain required courses: English 1, 2, 25, 26; Speech 29 and 30; Economics 25; Psychology 26; and twelve semester hours of science. In addition at least three hours must be elected from one of the following: History 5, 6, 59, 60, or Government 25.

The requirements in Physical Education must also be satisfied. All physically fit men students must take Military 1, 2, 25, and 26. A course of lectures on College Adjustments is required of women students.

Since the work of the first two years is largely directed toward a broad, general education as a foundation for the more specialized training of juniors and seniors, it follows that the program of studies for all schools is fairly uniform up to the junior year. Because of this students can readily change from one curriculum to another or even from one school to another as both freshmen and sophomores.



EDNA SKINNER HALL



PHYSICAL EDUCATION BUILDING



POND ON UNIVERSITY'S DEMONSTRATION FOREST NEAR AMHERST



CHADBOURNE AND GREENOUGH DORMITORIES FOR MEN

Regardless of major, students who plan to teach should register early, in their freshman year if possible, with the Department of Education although their work there does not begin until junior year.

The minimum requirement for graduation is 60 junior-senior credits in addition to the satisfactory completion of the required and elective work of the first two years. Except upon special permission from the Scholarship Committee no junior or senior shall enroll for more than 17 or less than 14 credits each semester.

During the junior and senior years each student shall complete not less than 15 and not more than 30 credits in junior-senior courses in the department in which he is specializing.

A new administrative organization which will combine the School of Liberal Arts and the School of Science into a College of Liberal Arts and Sciences was approved by the trustees in January 1949. Until the details of this organization have been worked out the Schools will continue to function as at present.

SCHOOL OF LIBERAL ARTS

FRANK PRENTICE RAND, *Acting Dean*

The School of Liberal Arts comprises the departments of Education, English, German, Romance Languages, Economics and Government, History and Sociology, Psychology, and Fine Arts. It offers a broad liberal program of studies aimed at giving the student a general cultural education in addition to professional training in certain fields. It also offers required and elective courses for students in other schools.

Students who satisfy the Liberal Arts requirements of the freshman and sophomore years and who as juniors and seniors complete the requirements for specialization in one of the several departments of the School qualify for the A.B. degree. However, students specializing in the departments of Psychology and Education may qualify for the B.S. degree by electing fifteen junior-senior credits in the Physical and Biological sciences.

Those enrolled in this School are required to take fundamental courses in the humanities, mathematics, and the physical, biological, and social sciences in the first two years. As a junior and senior each student selects a major from one of the following: Economics, Government, Education, Psychology, History, Sociology, English, French, Romance Languages, German, and Fine Arts.

CURRICULA IN LIBERAL ARTS

The courses for the first two years are largely prescribed. Each student therefore follows a fairly uniform program of studies until he begins his specialization.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
Mathematics 7	3	Mathematics 8 or 10	3
Chemistry or Biology (Botany and Zoology)	3	Chemistry or Biology (Botany and Zoology)	3
Foreign Language	3	Foreign Language	3
History 5	3	History 6	3
Physical Educational 7 (women)	2	Physical Education 8 (women)	2
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Hygiene (women)	1		

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	2	English 26, Survey of Lit.	2
Speech 29	1	Speech 30	1
Economics 25 or Psychology 26	3	Psychology 26 or Economics 25	3
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

One of the following Sciences each semester:

Bacteriology 31, 31A	4	Zoology 35	3
Botany 25	3	Botany 26	3
Chemistry 29	4	Chemistry 30	4
Chemistry 31	3	Chemistry 32	3
Geology 27	3	Geology 28	3
Mathematics 29	3	Mathematics 30	3
Physics 25	4	Physics 26	4
Zoology 25	3	Entomology 26	3

Two electives from the following each semester:

French 7, 29, or 31	3	French 8, 30, or 32	3
German 25	3	German 26	3
Government 25	3	Economics 26	3
History 31	3	Government 28	3
Spanish 1	3	Spanish 2	3
		History 32	3
		Psychology 28	3
		Sociology 28	3

1 If Economics is taken in the first semester, Psychology will be elected in the second and vice versa.

JUNIOR-SENIOR CURRICULA IN LIBERAL ARTS

Major work is available in the following departments during the last two years.

ECONOMICS

The department offers curricula in both Economics and Political Science.

ECONOMICS

P. L. GAMBLE, *Adviser*

In Economics the aims are twofold: (1) to give the student an understanding of economic theory and of the application of economics to the organization of society; (2) to provide students with the elementary training necessary for further study of economic and business problems.

The department requires that all majors irrespective of the career desired take the following courses: Economics 73, 79, Finance 53, Accounting 25, and Agricultural Economics 79 or Mathematics 62. In addition, each student must select an additional 12 credit hours of work from the Economics curriculum. No major student is permitted to take more than 36 junior-senior credit hours of economics, agricultural economics and business administration courses. In choosing elective courses students are urged to select courses in the humanities and preferably some from the allied fields of history, philosophy, psychology, and sociology. Those intending to major in Economics should elect Economics 26 in the sophomore year.

For the majors in the Economics department, there are offered courses which may be combined to serve as preparation toward a number of different careers. Among others, possible careers in the following fields are open:

Banking and Finance	Public Utilities
Government Service	Social Security
International Trade	Statistics
Labor and Personnel Relations	Transportation and Communication

GOVERNMENT

V. L. FERWERDA, *Adviser*

The work in government aims to give the student an understanding of the principles of government and their application to the organization of society, and to provide him with elementary training necessary for positions in government service or further study on the graduate level. It thus may be considered either as pre-law or pre-professional work, in addition to its general cultural utility.

Majors in the field should elect Government 25 and 28 in their sophomore year. In the junior and senior years a minimum of eight additional courses in government is recommended; these may be elected from the following: Government 52, 61, 62, 63, 64, 65, 66, 67, 68, 93, 94, or History 53. In addition eight supporting courses in other social sciences are recommended; these may be chosen from the fields of history, economics, sociology, or psychology. The remaining junior-senior courses should be chosen from the fields of languages, literature, philosophy, art, or music.

EDUCATION

A. W. PURVIS, *Adviser*

The Department seeks to utilize the forces of the University to prepare teachers for secondary schools and through its graduate offering to prepare administrators and specialists in the various phases of public education. Its teacher-training program is based upon the assumption that secondary school teachers should have a broad liberal education, considerable

mastery of the subject or group of subjects to be taught, and professional courses which should lead to a knowledge of the pupils to be taught, familiarity with the problems to be met, and new meaning to the subjects of instruction.

In order to realize these aims, all students who contemplate teaching or other school work as a career should register early, in their freshman year if possible, with the Department of Education although their work there does not begin until the junior year. Admission to either a minor or a major in Education will be determined largely by a composite rating based on scholarship as determined by University grades and success in the beginning course in History of Education, on the percentile rank of standard placement tests, and on personality ratings by members of the staff.

Currently there are two avenues leading toward a career of teaching in the secondary schools. The student may (1) major in Education or (2) minor in Education and major in subject-matter field to be taught.

THE MAJOR IN EDUCATION. This opportunity is intended for those students who desire to teach in one or more fields and who are seeking (1) a more diversified program than is possible under a subject-matter major and (2) a much wider opportunity to do practice teaching. Normally the student in his four years will schedule approximately thirty hours in one subject field, eighteen in a second subject field and eighteen in Education. The remaining hours will be distributed among supporting courses and courses in general education. The student should register early, in the freshman year if possible, in the Department of Education and should apply for the major in Education at the end of the sophomore year. He should elect History of Education 51 in the first semester of the junior year and candidates will be chosen for the major during that semester.

The following general outlines are given as examples of how the major in Education would apply to various teaching programs.

TEACHING ENGLISH AND HISTORY

First and second years—satisfy requirements of the School of Liberal Arts; elect Government 25, History 31, 32.

Third and fourth years—Education 51, 52, 53, 83, 85, 88.
English 18 hours, History 6 hours, general 18-21 hours.

TEACHING MATHEMATICS AND PHYSICS

First and second years—satisfy requirement of the School of Science; elect Mathematics 29, 30, Physics 25, 26.

Third and fourth years—Education 51, 52, 53, 83, 85, 88.
Mathematics 12 hours, Physics 12 hours, general 18-21 hours.

TEACHING CHEMISTRY AND BIOLOGY

First and second years—satisfy requirements of the School of Science; elect Chemistry 29, 30, Mathematics 29, 30, Botany 25, 26.

Third and fourth years—Education 51, 52, 53, 83, 85, 88. Chemistry 15 hours, Botany, Zoology 12 hours, general 15-18 hours.

THE MINOR IN EDUCATION. Training programs for students who desire to teach and to major in any of the Arts and Sciences or in Agriculture, Home Economics, Physical Education, or Extension are as follows:

TEACHER-TRAINING IN THE ARTS AND SCIENCES. The student should register early in the Department of Education and should usually elect prerequisite course, History of Education 51, in the first semester of the junior year. If the student is then accepted for a minor in Education he will normally take Education 52 and 88 in the second semester of the junior year, Education 53 and 83 in the first semester of the senior year and Education 85 in the last semester of the senior year. Opportunity for a restricted amount of practice teaching is available under Education 85 if the student's schedule permits. (Tuesday and Thursday should be free for this work.) A selected few from this group may be chosen each year for the One-Semester Plan if it is offered.

TEACHER-TRAINING IN AGRICULTURE. (Professor Oliver, adviser.) By a cooperative agreement with the State Division of Vocational Education, persons otherwise qualified may prepare to teach Vocational Agriculture by the satisfactory completion of Education 72, 73, and 75. Education 52 is also recommended. To insure a desirable range of preparation, students who contemplate vocational teaching should consult (early in the freshman year if possible) Professor Oliver and the State Supervisor of Agricultural Teacher-Training. A vocational teacher-training certificate is awarded by the Vocational Division to those who fully qualify.

TEACHER-TRAINING IN HOME ECONOMICS. (Professor Piatt, adviser.) These students will major in Home Economics and elect Education 51, 53, and 83, Home Economics 81 and 83, Psychology 55. A selected few may be chosen each year for the One-Semester Plan.

TEACHER-TRAINING IN PHYSICAL EDUCATION. (Professor Gore, adviser.) These students will major in Physical Education and elect at least eighteen hours of the academic field to be taught. They should elect Education 51, 52, 85, and 88, Physical Education 54, Psychology 55.

TEACHER-TRAINING IN EXTENSION. (Mr. Dayton, adviser.) The student will major in some branch of Agriculture, Horticulture (see page 121) or Home Economics (see page 132) and should elect courses in economics, speech, and journalism. They should elect Education 61 and 66.

ENGLISH

F. P. RAND, *Adviser*

The department of English offers courses in English composition and literature and in speech. Students majoring in this department must conform to the institutional and school requirements for freshman and sophomore years, and in choosing sophomore electives should include two semesters of modern language and one semester of English history.

The courses in English are intended to enable students to express themselves effectively and to appreciate humanistic values and the ideals of English-speaking people throughout their history. They also offer an appropriate, and in some instances an adequate, classroom training for work in such fields as teaching, authorship and editing.

The student must earn 30 credits in elective courses in English. However, for six of these he may substitute elective courses in other languages or speech.

FINE ARTS

J. ROBERTSON, D. ALVIANI, *Advisers*

The department of fine arts is to a certain extent inter-departmental and interscholastic, including that work of of various departments which is artistic in their contributed courses. For the present the aim of the department is to bring together art, music and other courses in self-expression until the growth of the work permits the development of several special departments. The work in art is basic in its approach to design, drawing and painting. The art appreciation courses are non-professional in scope but provide a better understanding of the arts, in history and quality. The courses in music furnish an understanding of the history and interpretation of music, provide basic professional theory and afford some opportunities for performance. In addition, the department has made arrangements with well-qualified private teachers to offer instruction, without course credit, in voice and instrumental music to individuals or glass groups.

The student majoring in fine arts is required to elect not less than 28 nor more than 30 credits from among the courses listed below. At least 15 credits must be from Group A or from Group B, and the student's adviser is assigned on this basis.

A	B	C
Music 25, 26	Art 33, 34	Home Ec. 31
Music 51, 52	Art 27, 28	Home Ec. 62
Music 61, 62	Art 31	Land Arch. 51
Music 75, 76	Art 75	Flori. 58
English 81	Land Arch. 83, 84	Phys. Ed. 61, 62, 81, 82
Speech 89	Art 77, 78	

GERMAN

A. N. JULIAN, *Adviser*

The courses in German are intended to give a practical knowledge of the language for the purpose of wider reading, research, and oral communication.

During the junior and senior years each student will complete not less than 24 and not more than 30 credits in the junior-senior German courses. Students planning to use the language professionally are also urged to supplement their courses here with a summer session at an approved school of German.

HISTORY AND SOCIOLOGY

Curricula in History and Sociology are offered.

HISTORY

T. C. CALDWELL, *Adviser*

The courses in History are intended to impart an understanding of the people of the world and their problems through an analysis of man's development in the past. A major in this field should provide the student with a broad cultural background and a basis for good citizenship. History may have special value for the following groups:

- (1) Those who plan to teach History or the Social Studies.
- (2) Those who plan careers in which considerable knowledge of history is desirable. These might be in fields such as Law, Government Service, Journalism, and Library Work.

Students who wish to major in this Department are expected to conform to the institutional and divisional requirements of the freshman and sophomore years, including History 5 and 6. In choosing sophomore electives they should include two semester courses in history.

In addition to the above courses, students are expected to take a minimum of 24 credits in the elective junior and senior courses. Government 25 should be elected in the junior year if not taken as a sophomore elective. History 59 and 60, American History, and History 91 and 92, Historical Bibliography are required.

SOCIOLOGY

J. H. KORSON, *Adviser*

The courses in Sociology are planned with two aims in view:

- (1) To give the student an understanding of the factors which influence men in their activities and interests as members of society, and
- (2) To prepare those students who are interested in teaching Social Studies at the high school level; or those students interested in careers with government agencies; or in careers as social workers with state or private agencies to

gain the pre-professional courses necessary before embarking on such careers. Most agencies require some work on the graduate level before full-time employment is obtained, while others offer in-training opportunities to graduate majors in Sociology.

SOCIAL WORK

Students interested in pre-professional training in Social Work are advised to follow the curriculum in Sociology. The American Association of Schools of Social Work indicates that the pre-professional subjects most closely related to professional work in this field are economics, political science, psychology, and sociology. The Association recommends that prospective students of Social Work or Social Administration take not fewer than 12 semester hours in one of these subjects while taking less in others. It also recognizes the value of courses in biology, history, English as well as other subjects contributing to a broad cultural background for the student.

Students who expect to major in Sociology are advised to elect freshman Biology and Zoology 35. At least 24 junior-senior credits in Sociology are required. Students are required to take Sociology 53 and 82 and are urged also to select courses in economics, history, government, and psychology.

JOURNALISM

A. B. MUSGRAVE, *Adviser*

The journalism courses are designed to provide professional guidance for students interested in newspaper work or related fields. Such students are advised to compete for membership on the college newspaper while freshmen or sophomores, take the introductory course (English 85) as juniors, and elect other courses in social science and literature. Selected seniors will be provided a limited amount of actual professional experience.

PSYCHOLOGY

C. C. NEET, *Adviser*

The courses in Psychology are designed (1) to impart an understanding of behavior and the application of this knowledge to problems of human adjustment; and (2) to give preparation for professional work in Psychology and related fields.

Careers open to Psychology majors include: teaching and research, guidance, psychometrics, personnel and industrial work, child welfare, abnormal and clinical psychology, and government service. Additional training is required for certain of these careers.

Students planning to major in psychology should elect Mathematics 10 in the freshman year and Psychology 28 in the sophomore year. In the junior and senior years majors

are advised to take a minimum of 24 credits in Psychology. Courses 51 and 90 are required. As broad a cultural background as major programs will permit is advised.

Majors planning careers primarily in experimental and physiological psychology should plan to take one or more courses during their four years in chemistry, mathematics, physics, and zoology. Those planning careers in abnormal and clinical psychology and in child welfare, should elect specified courses in education, English, home economics, sociology, and zoology; while those planning careers in psychometrics, guidance, personnel and industrial work, and government service should take certain courses in business administration, in economics, education, industrial engineering, and sociology.

ROMANCE LANGUAGES

C. F. FRAKER, S. C. GODING, *Advisers*

The courses in French and Spanish are intended to give a rounded knowledge of the language for the purpose of wider reading, oral communication, and research, leading to a better understanding of the art and the science and the peoples of French and Spanish speaking nations.

Students may specialize either in romance languages or in French alone. The student is required to earn 30 junior-senior credits in the department. Major students preparing to use a language professionally are usually urged to supplement their courses here with a summer session in an approved school of languages.

MODERN LANGUAGE

C. F. FRAKER, *Adviser*

The courses in French, German, and Spanish are intended to give a practical knowledge of these languages for the purpose of wider reading and research, leading to a better understanding of the art and the science and the peoples concerned. A student who is primarily interested in language work but does not wish to subject himself to the restrictions of a specific major should elect Modern Language.

The requirements are these: 30 credits in elective courses in French, German, Spanish (not including courses offered to fulfill the freshman-sophomore requirement of 12 credits in modern language). However, the student may substitute for 6 of these 30 credits, elective courses in English, Latin, or Speech. He may also supplement the 30 credits with not over 6 credits in elective courses in the same subjects.

SCHOOL OF SCIENCE

C. P. ALEXANDER, *Dean*

The School of Science includes the Departments of Bacteriology and Public Health, Botany, Chemistry and Chemical Engineering, Entomology, Zoology, Geology and Mineralogy, Mathematics, and Physics. The programs of study outlined by these departments lead to the degree of Bachelor of Science.

The School, through departments, provides professional and pre-professional training for those students planning to enter the fields of science. Courses in science required by, or of interest to, students enrolled in other divisions are also available.

Each department offers the usual requirements of undergraduate specialization in its particular field. These offerings enable the students to enter the fields of science and to continue to study for advanced degrees. In addition, special curricula are provided to meet the needs of special groups of students. These include curricula for pre-medical, pre-dental, and pre-veterinary students, and for those who plan to train as laboratory technicians and to enter Public Health Service.

The curricula in the School of Science are planned to provide a broad and cultural education, as well as opportunities for specialized training. To this end the work of the first two years is largely prescribed, specialization occurring in the junior and senior years. The concentration of the junior and senior years gives students as high a proficiency in their fields of specialization as is possible without sacrificing the objectives and requirements of a well-rounded education.

CURRICULA IN SCIENCE

FRESHMAN YEAR

Freshman work in the School of Science consists of definitely required subjects resulting in a fairly uniform program of studies for all students.

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
†Mathematics 7	3	†Mathematics 8 or 10	3
English 1, Composition	3	English 2, Composition	3
Chemistry 1, General	3	Chemistry 2, General	3
†Biology (Botany 1 or Zoo. 1)	3	†Biology (Botany 1, or Zoo. 1)	3
German 1 or 5, or French 1, 5, 15	3	German 2 or 6, or French 2, 6, 16	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
Hygiene (women)	1		

† Chemical engineering majors take Mathematics 5 and 6, and substitute Mechanical Engineering 1 and 2 for Biology.

SOPHOMORE YEAR

In the sophomore year each student must take the required English, a Social Science, a Science, and two elective courses under the direction of his advisor.

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	2	English 26, Survey of Lit.	2
Speech 29	1	Speech 30	1
Economics 25 or Psychology 26	3	Economics 25 or Psychology 26	3
¹ Science	3	Science	3
² Electives	6	Electives	6
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

¹Elect one of the following:

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 31, 31A	4	Botany 26	3
Botany 25	3	Chemistry 30	4
Chemistry 29	4	Chemistry 32	3
Chemistry 31	3	Entomology 26	3
Geology 27	3	Geology 28	3
Mathematics 29,31	3	Mathematics 30, 32	3
Physics 25	4	Physics 26	4
Zoology 25	3	Bacteriology 31, 31A	4
Zoology 35	3	Zoology 35	3

² To consist of additional sciences selected from the above list, or a Science and a Language. Chemical engineering majors also take Civil Engineering 34. In selecting the required and elective courses in Science and Language, students should be guided by the recommendations for Sophomore year given under the description of Junior-Senior curricula that follows.

JUNIOR-SENIOR CURRICULA IN SCIENCE

Major work is provided in the following departments. In addition, there are other special curricula both pre-professional that cut across departmental lines. Students desiring complete information in regard to the opportunities and program of study in each curriculum are expected to consult the adviser in charge.

BACTERIOLOGY AND PUBLIC HEALTH

The Department offers three curricula: one in Bacteriology, one in Public Health, and the other in Medical Technology.

BACTERIOLOGY

L. A. BRADLEY, Adviser

The courses in Bacteriology have been planned to furnish (1) a general training in this field for college students; (2) specialization for those contemplating a professional career in Bacteriology.

Majors in Bacteriology should elect the following in the sophomore year: Chemistry 29, 30; Physics 25, 26; Bacteriology 31, 31A; Zoology 35. The Physics may be deferred until the junior year to allow for additional language study.

Juniors and seniors must take Chemistry 51, 52, and 79; and Botany 66 and Zoology 84 in addition to the required work in Bacteriology and Public Health.

PUBLIC HEALTH

L. A. BRADLEY, *Adviser*

Through the cooperation of several departments of the College and the Massachusetts Department of Public Health, curricula are provided for (1) a limited number of students interested in the many phases of public health service for which graduate work in medical or engineering schools is not essential; and (2) students planning graduate work in Sanitary Engineering.

Particular attention will be given to the training of sanitarians, district sanitary officers, food and milk inspectors, water and sewage treatment plant operators, technicians for public health laboratories, and agents for local boards of health. Students planning graduate work in Sanitary Engineering must also take Mathematics 29 and 30 (calculus) before the end of their junior year.

The following curriculum is required of all upperclassmen:

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 51, Advanced	3	Public Health 62, Sanitation	3
Public Health 61, Sanitation	3	Bacteriology 90, Sanitary	3
Chemistry 31 or 51, Organic	3-4	Chemistry 32 or 52, Organic	3-4
Electives	6	Electives	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agr. Econ. 79, Statistics	3	Public Health 86, Field	
Public Health 84, Administration	3	Studies in Sanitation	3
Electives	9	Public Health 88, Epidemiology Communicable	
		Disease Control	3
		Electives	10

ELECTIVES

During the Junior-Senior years, students elect a minimum of 24 semester credits from the following:

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
An. Hus. 53, Elements of		Bact. 82, Food	3
Meat Packing	3	Public Health 64, Planktology	3
Chem. 63, Water and Sewage	3	Bot. 66, Industrial Mycology	3
Govt. 61, Public Administration	3	Dairy Ind. 52, Market Milk	4
Mech. Engineering 1, Drawing	3	Govt. 62, Public Administration	3
Civil Engineering 77, Water Supply	3	Civil Engin. 78, Sewerage	3
Food Tech. 75, Food Preservation	3	Ent. 60, Pest Control	3
Forestry 51, Management of Water Sheds	3	Ent. 74, Medical Ent.	3
Geol. 27, Physical Geology	3	Food Tech. 92, Food Analysis	3
Vet. Sci. 51, Animal Hygiene	3	Home Ec. 52, Nutrition	3
Zool. 69, Parasitology	3		

CURRICULUM IN MEDICAL TECHNOLOGY

R. L. FRANCE, *Adviser*

This curriculum provides a broad fundamental training for young women who plan to qualify as medical technologists. The program more than meets the basic collegiate requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists.

Through an agreement between the Bingham-Rockefeller Laboratories and the University, each year a certain number of graduates of the course will be accepted as technicians in laboratories supervised by the Bingham-Rockefeller Foundation. There the technicians will receive further theoretical and practical training so that after a year they will be qualified to take the examination for the Certificate of Medical Technologist. A satisfactory living salary is paid the technician during the year of training and unusual opportunities for advancement are offered.

Also, through the cooperation of the Bingham-Rockefeller laboratories, the University Placement Service, and the Department of Bacteriology and Public Health, graduates other than those accepted by the Bingham-Rockefeller foundation will be placed in laboratories certified by the American Society of Clinical Pathologists as qualified to train medical technologists.

Students taking this curriculum should complete the following sciences in the sophomore year: Bacteriology 31A; Chemistry 29, 30; and Zoology 35.

The junior-senior program follows:

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 51, Advanced	3	Bacteriology, 52, Advanced	3
Chemistry 31 or 51, Organic	3-4	Chemistry 32 or 52, Organic	3-4
Public Health 61, Sanitation	3	Public Health 62, Sanitation	
Zoology 51, Microtechnique	3	or Public Health 88, Com-	
Electives	3	municable disease control	3
		Electives*	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 81, Applied	3	Bacteriology 82, Applied	3
Bacteriology 85, Serology,		Bacteriology 92, Clinical	3
Immunology	3	Chemistry 80, Clinical	3
Zoology 69, Medical		Electives*	6
parasitology	3		
Electives	6		

* During the junior-senior years students elect 21 credits from the following:

History, required course
Chemistry 79, Physiological
Chemistry 82, Qualitative
organic

Zoology
Physics 25, 26 Introductory
Liberal Arts

BOTANY

A. V. OSMUN, *Adviser*

The purpose of the courses in Botany is primarily to provide a thorough background for specialization in the science, and secondarily to support and supplement the work of other fields in which knowledge of plant life is held to be important. Certain courses should likewise prove of interest and value to the general student.

Those who wish to specialize in Botany will find here an ample field and an adequate opportunity for advanced undergraduate study. Post-graduate training, often with provision for financial aid, is available in most graduate institutions, and many teaching, research and industrial positions in schools, and colleges, experiment stations, federal and state services and private enterprise are open to the trained botanist.

The curriculum offers to the student an opportunity to acquire either a broad general knowledge of Botany, or to devote himself to more extensive study in one of the major divisions of the science, such as Plant Morphology and Taxonomy, Plant Physiology, Mycology and Plant Pathology. Under the direction of his adviser each student selects a program of courses in botany and other sciences, humanities and arts which seems best adapted to his particular botanical objectives.

Specialization in Botany assumes the satisfactory completion of certain basic and supporting courses prior to the junior year. These include Botany 1, 25 and 26; Chemistry 1, 2 and 29; and a Modern Language. Two years of German are advised.

The junior-senior program requires that courses in Botany to the amount of 15-30 credits be chosen under the guidance of the adviser. He will also make recommendations in regard to electives.

CHEMISTRY AND CHEMICAL ENGINEERING

CHEMISTRY

W. S. RITCHIE, *Adviser*

The objectives in Chemistry are to give the student an understanding of the subject which will enable him to appreciate the relation of Chemistry to other sciences, and to industry, and to provide training for those who intend to become teachers and workers in the allied sciences, and for those who wish to go on to graduate study and a professional career in Chemistry. Completion of the course in Chemistry fits the student for positions in the chemical industries and related fields as well as in the agricultural industry, for employment in state and Federal agricultural experiment stations and commercial laboratories and for teaching.

Students planning to major in Chemistry should elect German in the freshman year. The sophomore program should

include Chemistry 29, 30; Mathematics 29, 30; and Physics 25, 26.

Work for the junior and senior years includes required courses in Analytical, Organic, and Physical Chemistry and the possibility of election in related and supporting fields. While the major is arranged to provide general and fundamental training in the science, work in the humanities and social sciences is also recommended. The desirability and necessity of a well rounded education must not be overlooked.

CHEMICAL ENGINEERING

K. B. CASHIN, *Adviser*

The courses in chemical engineering are designed to give the student a good background and thorough understanding of chemical engineering principles. The student studies the fundamental principles first and then proceeds to apply them in the solution of comprehensive problems and in the use and operation of pilot plant sized equipment.

Students planning to major in chemical engineering should elect German in the freshman year. The sophomore program should include Chemistry 29, 30; Mathematics 31, 32; Physics 25, 26; and Civil Engineering 34.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Chemistry 65, Physical	4	Chemistry 66, Physical	4
Chem. Engin. 57, Inorg. Tech.	3	Chem. Engin. 60, Heat-Energy	3
Chem. Engin. 55, Calculations	3	Chem. Engin. 56, Unit	
Civil Engin. 53, Strength	3	Operations I	3
		Professional elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Chem. Engin. 93, Comp. Prob.	3	Chem. Engin. 76, Abstracts	2
Chem. Engin. 97, Unit		Chem. Engin. 94, Comp.	
Ops. II	3	Prob. II	4
Elec. Engin. 63, Elements	3	Chem. Engin. 98, Adv. Unit	
Professional electives	5	Ops.	2
History	3	Elec. Engin. 74, Electronics	3
		Professional elective	3-4
		Economics 25 or Psychology	
		26	3

ENTOMOLOGY

C. P. ALEXANDER, *Adviser*

Courses in Entomology serve two purposes: (1) to give students a general knowledge of insects, particularly in their relations to man, his crops, his domestic animals, and his health; (2) to train students desiring to specialize in Entomology to become United States, state, or experiment station entomologists, teachers, forest entomologists, tree wardens, or to occupy other position where an expert knowledge of insects is required.

The courses in Beekeeping are offered with the following aims: (1) to meet the increase in vocational opportunities

for the production of bees or honey as a business; (2) to study the beekeeping needs of fruit and truck-crop industries and the part that bees play in the pollination of flowers; (3) to acquaint the student with a recreational field that can be made profitable.

Majors are required to take Entomology 26 in the sophomore year. Strongly recommended sophomore subjects include Botany 25, 26; Zoology 25; Chemistry 29, 30; Zoology 35; and either French or German, or both.

Juniors and seniors should support their work in Entomology with the following courses: Botany 51, 64, 65; Bacteriology 61, 62; Chemistry 51, 52; Zoology 51, 69, 70; Pomology 56; English 83; and courses in Education, Floriculture, Horticulture and languages.

GEOLOGY AND MINERALOGY

L. R. WILSON, *Advisor*

The offerings in Geology and Mineralogy are intended chiefly for those who wish to gain some acquaintance with one or more branches of earth science. For the general student prerequisite requirements are reduced to a minimum. A program of moderate specialization may be provided for science majors who are interested in Geology.

To major in geology a student must complete thirty credit hours of work in the department. Those who have completed nine or more credits in geology in addition to the sophomore courses by the end of the junior year, and who wish to satisfy major requirements for graduation in the field of geology, will be given individual or group problems in the senior year. The nature of the work will depend upon student interest and preparation. In any junior or senior course in geology an additional period per week without credit may be required of students who specialize in this field. Chemistry through qualitative analysis and a year's work in college physics represent minimum requirements in these respective fields for undergraduate specialization in Physical Geology. For those interested in pursuing studies in stratigraphy or paleontology, work beyond the freshman year in the systematic aspects of both botany and zoology is essential for satisfactory progress.

MATHEMATICS

A. E. ANDERSEN, *Advisor*

The Department offers courses designed to furnish a cultural background as well as a foundation for both undergraduate and graduate work in such fields of science as physics and chemistry, in engineering and other technical subjects.

Major work is available for those desiring to make the teaching of Mathematics and Science, actuarial and statistical work their profession.

Each student who plans to major in Mathematics will, upon consultation with his adviser, select a program of studies

best suited to his individual needs. He is required to take Mathematics 29 and 30 in the sophomore year and is advised to include Physics 25 and 26.

During the junior and senior years each major must complete at least 24 credits in the following courses: Mathematics 55, 60, 62, 65, 66, 71, 72, 91, 92, and 94.

PHYSICS

W. F. POWERS, *Adviser*

The Physics courses give opportunity for the study of basic physical laws and phenomena of nature.

Emphasis is put on the applications of the principles studied. From these courses students may make a selection to satisfy a major in Physics, or to comply with requirements for graduate study.

Majors must take Physics 25, 26 and Mathematics 29, 30 in the sophomore year. They are also advised to elect Chemistry 31 and 32.

Juniors and seniors should plan to take all of the courses offered by the Department. These courses should be supported by additional work in mathematics and chemistry. As the interests of major students will vary, the Department members will be glad to make suggestions to individuals regarding their program of studies.

ZOOLOGY

G. L. WOODSIDE, *Adviser*

The courses in Zoology have two major aims: (1) to offer students an opportunity to develop an understanding and appreciation of the scientific method as a part of a liberal education; and (2) to provide training for prospective graduate students in Biology, Medicine, Dentistry, and related fields, as well as future teachers and laboratory technicians in the biological sciences.

The minimum requirements for majors are: Zoology 1, 35, 50, 65, 66, 75, 76, and either 83 or 84; Chemistry 1, 2, 29, 30, 51, 52; Physics 25, 26; and Plant Breeding (Genetics) 51.

SPECIAL CURRICULA IN SCIENCE

In addition to the major work provided in the Departments previously listed the following special curricula are available. For the most part these cut across departmental and even divisional lines. Students in these curricula follow the uniform science program for the freshman year and the recommendation in regard to sophomore electives indicated in each curriculum.

PRE-MEDICAL CURRICULUM

Advisory Committee: G. L. Woodside, Chairman, W. L. Machmer, G. W. Alderman, L. M. Bartlett, R. W. Fessenden, J. H. Smith.

Students planning to enter Medical, Dental or Veterinary Schools should register for this curriculum. Applicants for admission to such professional schools far exceed the number that can be accepted. Students should realize, therefore, that only well qualified, high ranking candidates may be admitted.

Although some professional schools do not require the Bachelor's degree for admission, it is highly desirable that a student plan to complete the work for the B.S. or A.B. For this the University requirement of a minimum of fifteen junior-senior credits in some one department must be met in conjunction with the curriculum outlined below.

During the first two years students in this curriculum follow the School of Science program as outlined on page 106. In the sophomore year they should elect the following: Chemistry 29, 30; Physics 25, 26; German 25, 26. In the senior year Chemistry 65, 66 (Physical) is highly recommended (prerequisites, Mathematics 29, 30).

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Zoology 65, Comp. Vert.		Zoology 66, Comp. Vert.	
Anatomy	3	Anatomy	3
History	3	Electives	9
Electives	6		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Zoology 75, Vert. Embryology	3	Zoology 76, Vert. Embryology	3
Electives	12	Zoology 84 Cellular	4
		Electives	9

The electives of the junior and senior years should include the requirements of the department in which the student wishes to major. Pre-medical students should elect as many courses in the School of Liberal Arts as possible, since Class A medical schools uniformly stress the importance of a broad general education.

CURRICULUM IN NURSING

L. A. BRADLEY, *Adviser*

The opportunity is available for women students completing two years of study to transfer to the Cornell School of Nursing and other accredited Schools of Nursing, and after three years to obtain both the degree of B.S. and R.N. Such students must include in their freshman and sophomore programs six hours of chemistry, six hours of biology, and three hours of psychology.

CURRICULUM IN RECREATIONAL LEADERSHIP

W. G. VINAL, *Adviser*

This curriculum is opened to a limited number of recommended students who seek training as leaders in the various recreational activities (physical, park, community, nature, camping, and the like).

The course of each student is planned to fit his personal aims and aptitudes. The freshman and sophomore requirements are those of the Division of Physical and Biological Sciences. The required upperclass courses are Bacteriology 61, Art 75; Biological Field Studies 51 and 52, 61 and 62 or Physical Education 73. A minimum of 15 semester hours in some one field related to that branch of Recreational Leadership chosen by the student is expected.

Because programs of study vary with the individual student, three types of curricula taken by former students, are given below:

PLAYGROUND LEADER IN URBAN AREAS

JUNIOR YEAR

German 25 Physical Educ. 53
Physics 25 German 26
Forestry 55 Forestry 56
Biol. Field Stu. 51 Biol. Field Stu. 52
Physical Educ. 55 Physical Edu. 72

SENIOR YEAR

Bacteriology 61 Entomology 26
Land Arch 51 English 64
Land Arch 79 Land Arch 52
Art 75 Bacteriology 62
Biol. Field Stu. 61 Biol. Field Stu. 62
Physical Educ. 71 Physical Educ. 52

RANGER NATURALIST IN METROPOLITAN AND NATIONAL PARKS

Military Science 51	Military Sci. 52	Military Sci. 75	Military Sci. 76
Sociology 51	Land Arch 52	Botany 81	Botany 84
Land Arch 51	Economics 25	Land Arch 75	Geology 62
Bacteriology 61	Astronomy 58	Botany 25	Physical Educ. 72
Forestry 55	Forestry 56	Speech 91	Biol. Field Stu. 62
Biol. Field Stu. 51	Biol. Field Stu. 52	Biol. Field Stu. 61	

COMMUNITY RECREATION

Sociology 51	Entomology 90	English 65	English 51
Education 51	Speech 89	Speech 91	English 68
French 29	French 30	French 71	Home Econ. 80
Bacteriology 61	English 46	Land Arch 75	Physical Ed. 82
Physical Ed. 61	Physical Ed. 62	Physical Ed. 81	Biol. Field Stu. 62
Biol. Field Stu. 51	Biol. Field Stu. 52	Biol. Field Stu. 61	Physics 58
Music 61			

SCHOOL OF AGRICULTURE

V. A. RICE, *Dean*

"Without food, nothing else matters." Perhaps partly for this reason at least, Agriculture is America's largest single industry. Not only is it large, but it is also extremely varied.

Over six million individual farms are now operated in the United States and many more will be needed for an "economy of abundance" in which all our citizens are to have, among other things, an adequate diet.

About one-quarter of a million scientists are now serving in Agriculture and its related fields, and more are needed if we are to increase our crop and animal production; conserve and improve our soil; control or eliminate plant and animal pests; improve the efficiency of our processing, storage, and distributing services; discover and apply new scientific and engineering principles to agricultural production and distribution, and new social and humanistic principles to rural living.

About eight million people make their living by providing necessary supplies to farmers and by moving our huge agricultural production to the consumer's table. Their tasks vary from supplying money, feeds, fertilizers, and a host of other necessities to farmers, to processing, storing and distributing the raw materials of farm production.

Agriculturally trained students find outlets for their training, ambition, and energies in the three principal fields suggested above, namely: (1) actual farm production either as farm owners or managers; (2) some scientific phase such as research on either a state, federal, or commercial basis; teaching at the secondary, collegiate, or extension level; or administration of state or federal production, conservation or financial programs; (3) the commercial phases of supplying farm machinery, electric power and equipment, seeds, feeds, fertilizers, insecticides, etc., or in processing, storing and marketing agricultural products of all sorts through either private or cooperative channels.

The work in the School of Agriculture is planned to provide a sound superstructure of applied science and technology reared on a firm and broad foundation of pure science and social humanistic studies. Upon graduation the student will have devoted about one-quarter of his time to pure science, one-quarter to social and humanistic studies, and one-half to applied science and technology in the various fields of Agriculture.

All students in the School must successfully complete one summer of placement training on a farm, in a dairy plant or in some business allied to Agriculture as stipulated by their major adviser. It is recommended that this graduation requirement be met during the summer immediately following the sophomore year of University residence.

During the spring of the senior year, they must also pass a comprehensive written examination set by the Department in which they are majoring; a comprehensive oral examination covering the whole field of Agriculture administered by a visiting board of agricultural leaders; and must present an oral paper on some personally chosen topic before another visiting board of agricultural leaders.

In order to prevent too narrow undergraduate specialization, no student will be allowed to offer for credit more than 16 junior-senior semester courses from the Schools of Agriculture and Horticulture. In other words, one or two courses in Science or Liberal Arts must be carried during each semester of the junior and senior years.

CURRICULA IN AGRICULTURE

The School of Agriculture comprises the following Departments: Agricultural Economics and Farm Management; Agronomy; Animal Husbandry; Dairy Industry; Poultry Husbandry; and Veterinary Science. Students may major in any one of these Departments (except Veterinary Science) during the junior and senior years, or may take the curriculum in General Agriculture. The engineering phases of Agricultural production and processing are handled in the School of Engineering.

UNIFORM FRESHMAN AND SOPHOMORE YEARS

All students majoring in Agriculture will take the following uniform curriculum during the first two years:

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
¹ Mathematics 7, Algebra and Trigonometry	3	Mathematics 8, Algebra	3
Chemistry 1, General	3	Chemistry 2, General	3
Botany 1, General	3	Zoology 1, General	3
Agricultural 1, Survey	3	Agronomy 2, Soils	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
		Hygiene (women)	1

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	2	English 26, Survey of Lit.	2
Speech 29	1	Speech 30	1
Economics 25, Elements	3	Psychology 26, General	3
² A Science		² A Science	3
³ Dairy Industry 25 and or	3	³ Animal Husbandry 26 and or	3
Poultry Husbandry 25	3	Agriculture Economics 26	3
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

¹ Students who are prepared and wish to take Calculus as sophomores should elect Mathematics 7 and 10. Candidates for the Bachelor of Vocational Agriculture degree take History in place of Mathematics.

² To be selected from the following:

1st Semester	Credits	2nd Semester	Credits
Bacteriology 31, 31A	4	Zoology 35	3
Botany 25	3	Botany 26	3
Chemistry 29	4	Chemistry 30	4
Chemistry 31	3	Chemistry 32	3
Geology 27	3	Geology 28	3
Mathematics 29	3	Mathematics 30	3
Physics 25	4	Physics 26	4
Zoology 25	3	Entomology 26	3

³ Both Dairy Industry and Poultry Husbandry or only one may be elected in the first semester; Animal Husbandry and Agricultural Economics in the second. If only one is elected each semester, an additional Science should be selected from the above group.

Poultry 25 is not open to majors in Poultry Husbandry.

JUNIOR-SENIOR CURRICULA IN AGRICULTURE

At the end of the sophomore year each student selects one of the following curricula as his major for the last two years.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

A. H. LINDSEY, *Adviser*

The purpose of the Agricultural Economics and Farm Management major is to train students for positions in those private and government institutions servicing the agricultural industry and to assist in the training of farm managers.

The Department maintains an inventory of current price information and agricultural production reports from which price study and analysis may be made. Statistical machines are also available for computation and analysis. The laboratories of the Department must be found in business institutions and on farms in Massachusetts with which contact is maintained.

Two curricula are available.

AGRICULTURAL ECONOMICS

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Ag. Ec. 55, Mark'g Farm Prod.	3	Ag. Ec. 56, Coop. in Agri.	3
Ag. Ec. 57, Agri. Credit	3	Agricultural Electives	6
Agricultural Electives	6	General Electives	6
General Electives	3		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Accounting 25	3	Agri. Ec. 76, Farm Mgt.	4
Agri. Ec. 79, El. Statis.	3	Agricultural Electives	3
Agricultural Electives	3	General Electives	9
General Electives	6		

All Agricultural Economics majors must take the courses listed above. Specialization may be in one of the three following fields: (1) Animal Products, (2) Fruits and Vegetables, (3) Feeds and Fertilizers.

The following courses must be completed for each of these specialized fields:

<i>Animal Products</i>	<i>Fruits and Vegetables</i>	<i>Feeds and Fertilizer</i>
An. Husb. 53	Pomology 53	Agronomy 51
An. Husb. 73	Pomology 77	Agronomy 52
Dairy 52	Olericulture 74	Agronomy 78
Dairy 77	Olericulture 78	An. Husb. 51
Dairy 78	Food Technology 51	An. Husb. 78
Poultry 75	Food Technology 52	Poultry 51

FARM MANAGEMENT

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agri. Ec. 55, Mktg. Farm Prod.	3	Agri. Ec. 56, Coop. Agri. Agronomy 52, Soil Util.	3
Agri. Ec. 57, Agri. Cr.	3	Agri. Ec. 78, Land Econ.	3
An. Husb. 51, Nutrition	3	Bus. Law 70	3
Electives	6	Electives	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agri. Ec. 71, Theory	3	Agri. Ec. 76, Farm Mgt.	4
Agronomy 51, Field Crops	3	An. Husb. 78, Dairy Cattle Prod.	4
Forestry 55, Mgt. Woodlands	3	Poultry 78, Management	2
Electives	6	Electives	6

AGRONOMY

DALE H. SIELING, *Adviser*

The Department of Agronomy is equipped with modern soils, crops and chemical laboratories, greenhouses, and utilizes parts of the College Farm for fertilizer and plant growth experimentation, and for demonstration of soil utilization and conservation.

The courses are designed to give instruction concerning the basic knowledge of the soil and its management, fertilizers, and their uses as related to the principal products of the field.

Crop culture and management courses are presented for those students from other departments who intend to make general farming their primary occupation after graduation. Crop improvement practices and the science of crop improvement are stressed for those who are interested in agronomy as a specialty. Instruction is given to prepare students for employment in the soil Conservation Service, governmental bureaus and commercial services where application of scientific principles is emphasized.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agron. 51, Field Crops	3	Agron. 52, Soil Utilization	3
Plant Breed'g 51, Genetics	3	Electives	9
Electives	6		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agron. 57, Soil Formation	3	Agron. 78, Fertilizers	3
Chem. 51, Organic	4	Chem. 52, Organic	4
Electives	9	Electives	9

ANIMAL HUSBANDRY

V. A. RICE, *Adviser*

In the College barns are maintained Percheron horses; Ayrshire, Guernsey, Hereford, Jersey, Holstein and Milking Shorthorn cattle; Shroshire and Southdown sheep; and Chester White swine. The College Farm is operated as a livestock farm producing all its necessary roughage in the form of pastures, hay and silage and a portion of its required grain.

The broad purpose of the Animal Husbandry major is that of providing the basic training for specialists in Animal Husbandry. Upon graduation, opportunities are available in the practical, scientific or commercial fields of Animal Husbandry; i.e., livestock farming, research, teaching, administration, or in the business phases of the livestock industry.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
An. Husb. 51, Nutrition of Farm An.	3	An. Husb. 56, 56A	4
An. Husb. 53, El. Meat Packing	3	Agron. 78, Fertilizers	3
Agron. 51, Field Crops	3	Vet. Sci. 76, Gen. Vet. Pathology	3
Vet. Sci. 75, Comp. Vet. Anatomy	3	Electives	6
Electives	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
An. Husb. 75, An. Breeding	4	An. Husb. 78, Dairy Cattle Production	4
An. Husb. 81, Seminar	1	An. Husb. 82, Seminar	1
Agri. Ec. 55, Mktg. Farm Products	3	Agri. Ec. 76, Farm Mgt.	4
An. Husb. 79	3	Electives	9
Electives	6		

DAIRY INDUSTRY

D. J. HANKINSON, *Adviser*

Courses in Dairy Industry aim to teach the students sound, modern methods of milk handling and the manufacture of dairy products, as well as the practical application of chemistry, bacteriology, and economics to the many phases of dairy work.

The Department of Dairy Industry is housed in Flint Laboratory, a building fully equipped with modern machinery for handling, marketing, and testing milk, butter, cheese and ice cream.

In addition to the opportunities offered the Dairy Industry graduate as manager of a milk or ice cream plant, he is also prepared for college or high school teaching; for service in the fields of extension, research and investigation; and for various phases of sanitation and public health work with town, city, state or federal departments.

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Dairy Ind. 77, Butter and Cheese	4	Dairy Ind. 50, Judging	1
Chem. 51, Organic	4	Dairy Ind. 52, Mkt. Milk	4
Bact. 61, Public Health	3	Chem. 52, Organic	4
Electives	6	Electives	6

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Dairy Ind. 75, Chemistry	3	Engineering 80, Dairy Mech.	2
Dairy Ind. 79, Seminar	1	Dairy Ind. 78, Ice Cream	4
Bact. 81, Applied	3	Dairy Ind. 80, Seminar	1
Electives	9	Bact. 82, Applied	3
		Electives	6

POULTRY HUSBANDRY

F. P. JEFFEREY, Adviser

The Department gives instruction in the science, art and practices of poultry keeping, not only to students specializing in this Department, but also to those in other departments who desire supporting work in Poultry Husbandry. The major courses prepare men for the successful operation of commercial poultry and breeding farms and hatcheries either as owners or managers; for high school, college and federal work in teaching, extension and research; and as service men, specialists and managers in industrial fields allied to the Poultry industry.

Rhode Island Red, Barred Plymouth Rocks, White Plymouth Rocks, New Hampshire, and S. C. White Leghorns and several other breeds are maintained on a commercial basis at the Poultry Plant. There are modern buildings in which ventilation, breeding, feeding, incubation, brooding, marketing and managerial experimental projects are taking place, with up-to-date equipment.

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Poultry Husb. 55, Housing and Sanitation	3	Poultry Husb. 52, Incubation and Brooding	3
Poultry Husb. 53, Judging	3	Poultry Husb. 56, Nutrition	3
Zoology 35	3	Electives	10-11
Electives	8		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Poultry Husb. 75, Market'g	2	Poultry Husb. 78, Seminar and Farm Management	3-4
Poultry Husb. 77, Breeding	3	Poultry Husb. 76, Turkey Prod.	2
Electives	12	Vet. Sci. 88, Avian Path.	3
		Electives	8-9

CURRICULUM IN GENERAL AGRICULTURE

V. A. RICE, Adviser

If, instead of majoring in any single Department, a student wishes to spread his major over the whole field of Agriculture, he may elect the following curriculum in General Agriculture:

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
An. Husb. 51, Nutrition of Farm Animals	3	Dairy Ind. 52, Market Milk	4
Agron. 51, Field Crops	3	Agron. 78, Fertilizers	3
Pomology 53, General	3	Olericulture 78, Commercial	3
Electives	6	Electives	6

SENIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Agri. Ec. 55, Mktg. Farm Prod.	3	Agri. Ec. 76, Farm Or. and Mgt.	4
Vet. Sci. 51	3	An. Husb. 78, Dairy Cattle Prod.	4
Forestry 55, Mgt. of Woodlands	3	Poultry Husb. 78, Farm Mgt.	3
Electives	6	Electives	6

CURRICULUM IN AGRICULTURE AND HORTICULTURE FOR EXTENSION WORK

JAMES W. DAYTON, *Adviser*

There is an excellent opportunity in the Extension Service for a limited number of students interested in county agent and 4-H Club work. For a position in this field a student should have a general agricultural and horticultural education. Apprentice training between the junior and senior years is recommended.

FRESHMAN AND SOPHOMORE YEARS

For the first two years the student follows the curriculum in either the School of Agriculture or the School of Horticulture.

JUNIOR-SENIOR CURRICULUM

The student chooses a major in Agricultural Economics, Animal Husbandry, Pomology, Poultry, or Olericulture, taking 15 credits in the department in which he is specializing and the following courses: Economics 55, Education 61 and 66, English 81, Journalism 85 and 86, Psychology 55, Speech 91 and 92.

Electives should be chosen from the following, if not included in the freshman or sophomore year, or as a major:

Agriculture 1	Agricultural Engineering 72, 74
Agricultural Economics 26, 55, 76, 82	Entomology 26, 51, 80
Agronomy 51, 78	Forestry 55, 56
Animal Husbandry 26, 51, 75, 78, 91	Geology 27, 28
Bacteriology 31	History—3 credits
Botany 25, 51, 77, 78	Horticulture 1
Chemistry 31, 32	Olericulture 25, 51, 74, 78
Dairy 25	Physics 57
	Pomology 26, 51, 53, 56
	Veterinary 51

VETERINARY SCIENCE

Though major work in Veterinary Science is not available, the Department does offer supporting courses to assist students who expect to enter the various fields of Agriculture, Public Health, teaching and laboratory work in the biological sciences or Veterinary Medicine.

SCHOOL OF BUSINESS ADMINISTRATION

PHILIP L. GAMBLE, *Acting Dean*

The School of Business Administration is designed to prepare students for the numerous activities connected with the inception, operation and control of business enterprises without overlooking the need for a well-rounded education. Three specialized and one general curricula are offered to better prepare students for assuming the responsibilities of the adult citizen. Each of these curricula emphasizes general education in a common program for the first two years and reserves concentration on specialized programs for the last two years.

The three differentiated and specialized curricula offered for the junior-senior years are in Accounting, Industrial Administration, and Marketing. These curricula are supplemented by a less specialized curriculum in General Business. Each course of study leads to the degree of Bachelor of Business Administration.

CURRICULA IN BUSINESS ADMINISTRATION

The courses for the first two years are largely prescribed. Each student therefore follows a nearly uniform program of studies until he begins his specialization. General education is emphasized by providing fundamental courses in the humanities, mathematics, science, and social science.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Government 25, American	3	History 6, Mod. European	
Mathematics 7	3	Civ.	3
English 1, Composition	3	Mathematics 8 or 10	3
Foreign Language or Economics 11, Econ. Geography	3	English 2, Composition	3
Elective, Science	3	Foreign Language or Economics 12, Ec. Hist. of U.S.	3
		Elective, Science	3

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Accounting 25, Principles of	3	Accounting 26, Principles of	3
Economics 25, Elements	3	Economics 26, Distribution	3
English 25, Survey of Eng. Lit.	3	English 26, Survey of Eng. Lit.	3
Psychology 26, General	3	Sociology 28, Elements	3
Elective	3	Elective	3

JUNIOR-SENIOR CURRICULA IN BUSINESS ADMINISTRATION

GENERAL BUSINESS

PHILIP L. GAMBLE, *Adviser*

This program is offered to meet the needs of those students whose interest is in general business rather than in some more specialized field. The program is designed to provide training in the social sciences, particularly economics,

as well as in the applied fields of business administration. This training should fit a man for initial employment in the training courses of large corporations or for work in small businesses and for further study in graduate school of a more specialized nature.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Credit	3	Business Law 70	3
Mktg. 53, Marketing & Mktg. Prob.	3	Ec. 56, Business Cycles	3
Ec. 79, Labor Problems	3	Ec. 76, Prin. of Transportation	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Ec. 80, Labor Legislation	3
Elective	3	Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 57, Corporation Finance	3	Ec. 70, Monopolies	3
Ec. 73, Modern Econ. Theory	3	Ec. 78, Public Finance	3
Ind. Adm. 83, Business Mgt.	3	Professional Elective*	3
Professional Elective*	3	Electives	6
Elective	3		

* Professional electives are to be chosen subject to the approval of the adviser.

ACCOUNTING

RICHARD M. COLWELL, *Adviser*

This curriculum is designed to train students to understand business operations from the viewpoint of income, costs, valuation, financial systems and policies and the interpretation and execution thereof. In addition to providing a general business background, this curriculum is the foundation for advanced training in accountancy and financial management. The special positions of accountancy for which students can qualify are: auditors, certified public accountants, comptrollers, cost analysts, credit analysts, income-tax consultants, industrial accountants, public accountants, private accountants, system designers, and teachers of accounting.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 51, Ec. of Bus. & Industry	3	Business Law 70	3
Ec. 53, Money, Banking & Credit	3	Acctg. 72, Advanced Acctg.	3
Mktg. 53, Marketing & Mktg. Prob.	3	English 84, Expository Writing	3
Acctg. 71, Advanced Acctg.	3	Electives	6
Ag. Ec. 79, Prin. & Methods of Statistics	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 57, Corporation Finance	3	Ec. 78, Public Finance	3
Ec. 73, Modern Ec. Theory	3	Ec. 82, Investments	3
Ind. Adm. 83, Business Mgt.	3	Acctg. 74, Acctg. Systems	3
Acct. 73, Cost Accounting	3	Acctg. 76, Auditing	3
Elective	3	Elective	3

INDUSTRIAL ADMINISTRATION

SHERMAN HOAR, *Adviser*

Expanding American industry now offers to qualified students the opportunity to find satisfying careers in the various fields of industrial management, labor relations, or personnel management. The curriculum offered is designed to give the student specialized training in these fields and a detailed and comprehensive understanding of the problems of business enterprise.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Mktg. 53, Mktg., & Mktg. Prob.	3	Business Law 70	3
Ec. 79, Labor Problems	3	Acctg. 74, Acctg. Systems	3
Ind. Adm. 83, Business Mgt.	3	Ec. 80, Labor Legislation	3
Acctg. 73, Cost Accounting	3	Mktg. 52, Industrial Purchasing	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Mech. Engin. 28, Machine Shop	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Crdt.	3	Ec. 76, Prin. of Transportation	3
Ec. 57, Corporation Finance	3	Mech. Engin. 88, Time & Motion Study	3
Ec. 73, Modern Ec. Theory	3	Psych. 86, Industrial	3
Electives	6	Ind. Adm. 84, Personnel Adminis.	3
		Electives	3

MARKETING

HAROLD E. HARDY, *Adviser*

This program is designed to train students to understand the advertising, selling and related problems of wholesale and retail enterprises and industrial firms. The curriculum offers general training in economics and business principles along with specialized study of basic types of market operations.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Crdt.	3	Mktg. 54, Sales Mgt. & Salesmanship	3
Mktg. 53, Mktg. & Mktg. Prob.	3	Mktg. 52, Industrial Purchasing	3
Ec. 79, Labor Problems	3	Business Law 70	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Ec. 76, Prin. of Transportation	3
Elective	3	Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 55, Ec. of Consumption	3	Mktg. 72, Market Research	3
Ec. 73, Modern Ec. Theory	3	Mktg. 74, New England Markets	3
Mktg. 71, Retail Merchandising	3	Psych. 86, Industrial Psych.	3
Mktg. 73, Advertising	3	Professional Elective*	3
Elective	3	Elective	3

* Professional elective is to be chosen subject to the approval of the adviser.

SCHOOL OF ENGINEERING

G. A. MARSTON, *Dean*

The departments of agricultural engineering, civil engineering, mechanical engineering and electrical engineering comprise the School of Engineering. Each department offers a curriculum leading to a Bachelor of Science Degree in that particular branch. An optional curriculum in industrial engineering is offered in the mechanical engineering department.

Engineering can be defined as the combination of science and art by which materials and power are made useful to mankind. An engineer requires intensive technical training but at the same time he should acquire the broad education that distinguishes the professional man from the technician. His education does not end with formal schooling but continues throughout his life as he accumulates experience.

The curricula in engineering have been carefully prepared to offer each student the opportunity to acquire a sound training in the fundamental work of the various branches of his chosen field. At the same time he receives a thorough training in the sciences and mathematics, which are the important tools of the engineer. About twenty per cent of his time is devoted to the social and humanistic studies. Some opportunity to pursue his particular interest is offered in the senior year.

The curriculum of the freshman year is the same for all. Specialization to a limited extent begins in the sophomore year.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
Mathematics 5, Analytical		Mathematics 6, Diff. Calculus	4
Geom.	4	Physics 26, General	4
Physics 25; General	4	Mechanical Eng. 2 (Drawing)	2
Mechanical Engineering 1		Military 2	2
(Drawing)	2	Physical Ed. 4	1
Military 1	3		
Physical Ed. 3	1		
Elect one of the following:			
History 5	3	History 6	3
German 1, 5	3	German 2, 6	3
French 1, 5, 15	3	French 2, 6, 16	3
Spanish 1, 7	3	Spanish 2, 8	3

JUNIOR-SENIOR CURRICULA

Majors in Engineering will select one of the following curricula.

AGRICULTURAL ENGINEERING

H. N. STAPLETON, *Adviser*

Agricultural engineering is concerned with the application of scientific engineering principles to the agricultural industry in which mechanical and electrical power, processing equipment, design and development of a farm structure,

soil and water conservation, research, extension, teaching, and promotional activities form parts.

The curriculum is designed to prepare students soundly in basic sciences, engineering, and humanistic subjects for service in this expanding field. There is opportunity for limited specialization and generous provision for electives in the third and fourth years.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Eng. 25, Lit. and Speech	3	English 26, Lit. and Speech	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Civil Engin. 27, Surveying	2	Civil Engin. 34, Applied	
Mech. Engin. 3, Descript.		Mech. (Statics)	3
Geom.	2	Civ. Engin. 26, Surveying	
Military 25	2	(Route)	3
Mech. Engin. 23, Shop	3	Military 26	2

SUMMER (6 WEEKS)

Civ. Engin. 28, Prop. & Topog. Surv.	3	Civ. Engin. 30, Route Surveying Prac.	3
(or approved industrial or farm employment)			

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Psych. 26 or Econ. 25	3	Econ. 25 or Psych. 26	3
Mech. Engin. 61, Test Materials	2	Agron. 2, Soils	3
Mech. Engin. 65, Heat Engin.	3	Mech. Engin. 68, Kinematics	3
Elect. Engin. 61, Principles of	4	Elect. Eng. 62, Prin. of Elec. Eng.	4
Civ. Engin. 51, Strength of Mat'l	4	Civ. Engin. 52, Applied Mech. (Kinetics)	3
Agricultural Elective	3	Agricultural Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ag. Engin. 71, Mech. Power	3	Ag. Eng. 76, Mech. Farm Equip.	3
Ag. Engin. 73, Farm Structures	4	Ag. Eng. 78, Drainage & Recl.	3
Civ. Engin. 75, Fluid Mechanics	3	Ag. Eng. 92, Seminar	1
Ag. Eng. 85, Farm Electrification	3	Ag. Ec. 76, Farm Org. & Mgt.	4
Mech. Engin. 83, Machine Design	3	Civ. Eng. 90, Contracts, Specif. & Est'g.	3
Tech. Elective	3	Tech. Elective	3

CIVIL ENGINEERING

G. A. MARSTON, *Adviser*

The profession of civil engineering once included all engineering practice other than military. Even today it includes such branches as structures of all types, highways and railroads, hydraulics as it applies to river control and power development, irrigation and drainage, sanitary engineering including water supply and sewerage works, and the broad field of surveying and mapping. Civil engineers by the nature of their work find many opportunities for employment with governmental agencies. Those who go into construction must

go wherever their projects take them, while those engaged in design, maintenance and operation are generally located in cities or towns.

The curriculum in civil engineering is designed to prepare the student for work in any of these fields. At the same time he is required to devote about one-fifth of his hours to the humanistic-social courses.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Lit. & Speech	3	English 26, Lit. & Speech	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Engin. 3, Descript.		Civ. Engin. 26, Route	
Geom.	2	Surveying	3
Civ. Engin. 25, Surveying	5	Civ. E. 34, Applied Mech.	
Military 25	2	(Statics)	3
		Military 26	2

SUMMER (6 WEEKS)

Civ. E. 28, Prop. & Topog.		Civ. Eng. 30, Route	
Surv.	3	Surveying Prac.	3

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Psych. 26 or Econ. 25	3	Econ. 25 or Psych. 26	3
Civ. Eng. 51, Strength of Mat'l.	4	Civ. Eng. 70, Theory of	
Civ. Eng. 55, Highway Engin.	3	Structures	4
Mech. Eng. 61, Testing Mat'l.	2	Civ. E. 52, Applied Mech.	
Elec. Engin. 63, Elements of	3	(Kinetics)	3
Geol. 50, Engin. Geol.	3	Civ. Engin. 80, Soil Mechanics	3
		Mech. Engin. 59, Mat'l. of	
		Constr.	2
		Civ. Engin. 76, Fluid	
		Mechanics	4

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Civ. Eng. 71, Structural		Civ. Eng. 72, Adv. Struct.	
Design	3	Theory	3
Civ. Eng. 73, Concrete &		Civ. Eng. 78, Sanitary Engin.	3
Masonry	4	Civ. Eng. 90, Contracts,	
Civ. Eng. 77, Water Supply	4	Specif. & Est.	3
Civ. Eng. 81, Foundations	2	Civ. Eng. 92, Professional	
English 83, Technical Writing	2	Sem.	1
Non-Tech. Elective (Am.		Pub. Health 66, Community	
Gov't. 25 recommended)	3	Sanit.	2
		Technical Elective*	3
		Non-Tech. Elective (Bus.	
		Law 70 recommended)	3
		*Econ. 76, Prin. of Transporta-	
		tion	
		*Mech. Eng. 65, Heat Engin.	
		*Civ. Eng. 56, Transportation	
		Engin.	
		*Civ. Engin. 94, Advanced Sur-	
		veying	
		*Civ. Engin. 96, Hydraulic	
		Engin.	
		*Bact. 54, Fundamentals of	
		Water & Sewerage Bact.	

ELECTRICAL ENGINEERING

ROBERT R. BROWN, *Adviser*

Electrical engineering is that branch of the profession covering the engineering applications of electricity. The first commercial application was street lighting some sixty years ago. The electric lamp was followed in a few years by the electric motor, transformers, telegraph, telephone, radio, electronic devices, etc., so that today electrical engineering reaches into every profession, every walk of life. It has become so broad, so extensive in its applications, that it is considered to be divided into various fields such as power, communications, illumination, electronics, control engineering, and others, each of these having specialized sub-divisions.

The undergraduate curriculum is designed to prepare the student for work in any of these fields, and to serve as a basis for specialization in any of them, either in advanced courses or in the field. At the same time, about one-fifth of the student's work is devoted to the humanistic-social courses so that he may have an understanding of the broader aspects of engineering and its relation to other fields of human endeavor.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Lit. & Speech	3	English 26, Lit. & Speech	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Eng. 3, Descript. Geom.	2	Civ. E. 34, Ap. Mech. (Statics)	3
Econ. 25 or Psych. 26	3	Elec. Engin. 40, Fundamentals	3
Military 25	2	Military 26	2

SUMMER

Mech. Engin. 23, Shop	3 credits
Civ. Engin. 27, Surveying	2 credits

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Elec. Eng. 51, A.C. Circuits	4	Econ. 25, or Psych. 26	3
Elec. Eng. 53, D.C. Machinery	4	Elec. Eng. 54, A.C. Machinery	4
Elec. E. 57, Engin. Anly.	3	Elec. Eng. 74, Electronics	4
Mech. Eng. 65, Heat Engin.. I	3	Civ. Eng. 61, Testing of Mat'ls.	2
Civ. Eng. 53, Strength of Mat'l.	3	Mech. Eng. 66, Heat Engin.	3
English 83, Technical Writing	2	Civ. E. 52, Applied Mech. (Kinetics)	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Elec. Eng. 75, Applied Electronics	4	Elec. E. 78, Transient Anly.	3
Elec. Eng. 77, Elec. Network Anly.	3	Ind. Eng. 86, Industrial Engin.	3
Mech. Eng. 79, Mech. Eng. Eng. Lab. I	2	Elec. Eng. 92, Prof. Sem.	1
Civ. Eng. 75, Fluid Mechanics	3	Technical Elective*	7 or 8
Technical Elective*	4	Non-Technical Elective	3
Non-Technical Elective	3	*Elec. E. 80, Elec. Comm. II	
*Elec. Eng. 79, Elec. Communications I		*Elec. E. 86, Power Syst. Netw.	
*Elec. Eng. 81, Adv. Elec. Mach.		*Elec. Eng. 84, Ind. Electronics	
		*Elec. Eng. 88, Comm. Netw.	
		*Elec. Eng. 90, Illumination	
		*Elec. Eng. 94, U.H.F. Tech.	
		*Elec. Eng. 96, Electromagnetic Engr.	
		*Elec. Eng. 82, Power Applications in Ind.	

MECHANICAL ENGINEERING

MAURICE E. BATES, *Adviser*

Mechanical engineering is that branch of the profession which, broadly speaking, covers the fields of heat, power, design of machinery, industrial management and manufacturing problems.

Building upon the foundation laid by the departments of mathematics, physics, and chemistry, the department of mechanical engineering undertakes to show the student how fundamental physical laws apply to this field of the profession. The courses selected give the student thorough training in the basic principles so that particular applications can be mastered in professional practice. Therefore, no attempt is made to give highly specialized instruction.

It must be realized that the modern engineer lives in a time of rapid social and technological change. Only the man who has had a well-balanced cultural and technical program of study can adjust quickly enough to the needs of a continually changing social order. The following curricula emphasize the fundamentals of the four M's of engineering; materials, methods, men, and money, a knowledge of which is vital to the modern engineer.

SUMMER (FOLLOWING FRESHMAN YEAR)

Mechanical Engineering 27 and 28, Shop 6 credit hours

SOPHOMORE YEAR

1st Semester	Credits	2nd Semester	Credits
English 25, Lit. & Speech	3	English 26, Lit. & Speech	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Eng. 3, Descript. Geom.	2	Civ. Eng. 34, Appld. Mech. (Statics)	3
Mech. Eng. 59, Mat'l. of Constr.	2	Mech. Eng. 72, Fund. of Metallurgy	3
Ind. Engin. 25, Prod. Processes	2	Military 26	2
Military 25	2		

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Econ. 25 or Psych. 26	3	Psych. 26 or Econ. 25	3
Civ. Engin. 52, Appld. Mech. (Kinetics)	3	Civ. Engin. 76, Fluid Mech.	4
Mech. E. 67, Mech. Instr. Lab.	1	Mech. Eng. 68, Kinematics	3
Mech. Eng. 63, Eng. Thermodynamics	4	Mech. Eng. 64, Eng. Thermodynamics	3
Elec. E. 61, Principles	4	Elec. Eng. 62, Principles	4
Civ. Eng 51, Strength of Mat'l.	4	Civ. Eng. 61, Testing of Mat'ls.	2

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Mech. Eng. 75, Power Plants	3	Mech. E. 76, Ref. & Air Cond.	3
Mech. E. 77, Internal Combust. E.	3	Mech. E. 80, Mech. Eng. Lab.	2
Mech. Eng. 79, Mech. Eng. Lab.	2	Mech. E. 86, Adv. Mach. Des.	3
Mech. Eng. 83, Machine Design	3	Technical Elect. †	6
Mech. Engin. 85, Dynamics of Mach.	3	Non-Tech. Elect. (Bus. Law 70 or Psych. 86, Ind. rec.)	3
Mech. Engin. 91, Sem.	1	†Mech. Engin. 82, Fluid Mach.	
Non-Technical Elect. (Am. Govt. 25 recommended)	3	Mech. Engin. 88, Steady-Flow Mach.	
		Mech. Eng. 90, Adv. Metallurgy	
		Elec. Eng. 65, Ind. Electricity	
		Ind. Engin. 86	

INDUSTRIAL ENGINEERING OPTION

W. H. WEAVER, *Adviser*

Industrial engineering is concerned with the engineering aspects of the organization, operation and management of manufacturing plants. It is based on the premise that the operation of a manufacturing plant is fundamentally an engineering activity. Consequently, the industrial engineering curriculum is built on a foundation of mechanical engineering. To the technical knowledge and scientific attitude developed through the study of engineering is added the study of certain courses in the humanities, in economics, and in management.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Econ. 25, or Psych. 26	3	Psych. 26 or Econ. 25	3
Mech. Eng. 65, Heat Engin.	3	Mech. Eng. 66, Heat Eng.	3
Civ. Eng. 53, Strength of Mat'l.	3	Civ. E. 52, Appld. Mech.	
Elec. Eng. 61, Prin. of Elec.		(Kinetics)	3
Eng.	4	Elec. Eng. 62, Prin. of E. E.	4
Acct. 25, Prin. of Bus.	3	Acct. 26, Prin. of Bus.	3
Ind. Engin. 51, Ind. Mgt.	3	Ec. 79, Labor Prob.	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Econ. 57, Corp. Finance	3	Ind. Adm. 84, Personnel	
Acctg. 73, Cost Acct.	3	Adm.	3
Mech. Engin. 79, Lab. I	2	Ind. Engin. 76, Time Study	3
Mech. Engin. 68, Kinematics	3	Ind. Engin. 78, Factory Pl.	2
Ind. Engin. 75, Job Evaluation	2	Ind. Engin. 80, Budget Con.	3
Ind. Engin. 77, Prod. Control	3	Ind. Engin. 82, Work Sim-	
Elective	2-3	plication	2
		Ind. Engin. 92, Sem.	1
		Elective	2-3

RECOMMENDED ELECTIVES

Psych. 86, Industrial	Soc. 28, Introduction
Ag. Econ. 79, Statistics	Govt. 25, American
Business Law 70	Mktg. 51, Sales Mgt.
Econ. 12, Ec. Hist. of U.S.	Elec. Engin. 65, Indus. Elec.
Econ. 80, Labor Legis.	English 83, Tech. Composition

SCHOOL OF HOME ECONOMICS

HELEN S. MITCHELL, *Dean*

Students majoring in Home Economics are fitted for a variety of professions as well as for successful home making in the broadest sense. The curricula provide for a general education including specialization in a chosen field of interest. Students with well-rounded personalities and some scientific inclination will find opportunities for intellectual growth and professional service in fields where well-trained women are in great demand. National professional organizations in this field set standards for which students may qualify in this program.

The four-year course in Home Economics includes a study of the physical, biological, and social sciences; English, History, and Art; and opportunities for electives in other fields. In the spring of her freshman year, each student is assigned to a member of the Home Economics faculty who will serve as a friendly personal adviser and help the student decide upon her choice of electives in the subsequent years.

UNIFORM FRESHMAN AND SOPHOMORE YEARS

All students in Home Economics will take the following uniform program of studies during the first two years:

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
Chemistry 1, General	3	Chemistry 2, General	3
*Zoology 1, History 5, or Mathematics 7	3	Mathematics 12	3
†Foreign Language	3	†Foreign Language	3
Home Economics 1, Intro- duction	3	Home Ec. 2, Clothing Selec- tion and Constr.	3
Physical Education 7	2	Physical Education 8	2

* Zoology 1 is especially recommended for those interested in Foods, Nutrition, or Child Development. History 5, Modern European Civilization, is a recommended alternative for those interested in art or design.

† Students who have had four years or more of two foreign languages in high school may substitute Zoology 1, History 5, or History 6.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	2	English 26, Survey of Lit.	2
Speech 29	1	Speech 30	1
Economics 25, Elements	3	Psychology 26, General	3
Chemistry 31, Organic	3	Chem. 32 or Zoology 35	3
†Home Ec. 31, Applied Art	3	Home Ec. 30, Foods	3
Elective	3	Elective	3
Physical Education 27	2	Physical Education 28	2
<i>Electives:</i>		<i>Electives:</i>	
*Bacteriology 31, 31A, Intro.	4	*Zoology 35	3
Drawing 31, Elem. Design	3	History 32, English	3
History 31, English	3	Home Ec. 26, Textiles	3
Language	3	Language	3

* Required of those wishing to qualify for American Dietetics Association membership.

† By special permission one of the following courses may be substituted for Home Economics 31: Home Economics 26, 61 or 62.

JUNIOR-SENIOR CURRICULA IN HOME ECONOMICS

A student may specialize in one of several fields of Home Economics during the junior and senior years. In consultation with her faculty adviser, each student will choose courses directly related to her objective. To qualify for a B.S. degree in Home Economics a student must have a minimum of 15 credits and not more than 30 credits in Home Economics subjects during the junior and senior years. The following curricula are suggestive. Those interested in other types of professional work or commercial positions of any other type should consult with advisers about desirable electives. For students not interested in professional work, a more liberal choice of electives is possible.

CHILD DEVELOPMENT AND FAMILY LIFE EDUCATION. Students interested in child development, nursery school work and social service work should choose this curriculum including subjects marked (C&F). The University is affiliated with the Merrill-Palmer School in Detroit which specializes in education for home and family life. One or two outstanding students may be selected each year to study there for one semester of the senior year.

FOODS AND NUTRITION AND INSTITUTION MANAGEMENT. This curriculum prepares for the professional fields of hospital or administrative dietitian or nutritionist and meets the requirements of courses approved by the American Dietetics Association. This curriculum is also advised for those interested in Home Service and commercial demonstrating related to foods. Courses marked (F&N) should be included in this curriculum.

PRE-RESEARCH IN NUTRITION. A new curriculum planned for the students who wish to prepare for graduate work in nutrition or biochemical research. Some of the usual required courses in Home Economics are waived in order to allow time for more of the basic sciences. The course should be planned with the advice of the Dean of the School.

HOME ECONOMICS EDUCATION. Students planning to teach may anticipate positions in junior and senior high schools and private schools. In addition to courses required of all Home Economics students, those marked (Ed) are recommended for those planning for any form of teaching. Electives should be chosen to prepare a student to be able to teach one other subject than Home Economics, a demand frequently made of young teachers. Students contemplating secondary school teaching should register with the department of Education.

EXTENSION WORK. This curriculum prepares students for such positions as home demonstration agents, 4-H Club leaders, or other positions in adult education. Apprentice training between junior and senior years is recommended. Courses marked (Ext) should be included in this curriculum.

TEXTILES, CLOTHING, AND RELATED ART. This curriculum is of interest to students who may wish to use clothing and related art in a general and aesthetic sense for their personal and family development. Students with ability and professional interest in the artistic and technical aspects of textiles, clothing, and related art are encouraged to go further in this field. Courses marked (T&C) should be included in this curriculum.

MERCHANDISING AND RETAILING. This curriculum is planned in cooperation with the School of Business Administration and provides an opportunity for girls interested in preparing for the merchandising field. The junior and senior curriculum includes courses in Home Economics and in Business Administration, and should be planned with the Dean of the School of Home Economics by the end of the freshman year if possible.

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
*Home Economics 51, Foods	3	Home Ec. 26, Textiles (Ed)	
Home Ec. 61, Clothing Select. and Constr. (Ed) (Ext.) (T&C)	3	(Ext) (T&C)	3
*Home Ec. 75, Ec. of Household	3	*Home Ec. 52, Nutrition	3
Education (F&N) (Ed) (Ext)	3	Home Ec. 62, Home Furnish (Ext) (T&C)	3
Agric. Engin. 51, House Planning (Ext) (T&C)	3	Home Ec. 86, Child Development (C&F) (Ed) (Ext)	3
Chem. 79, Physiological (F&N)	4	Education (Ed)	3
Journalism 85 (Ext)	3	Home Ec. 60, Household Equipment (Ed) (Ext)	3
Electives		Floriculture 58 (Ext) (T&C)	3
		Food Tech. 75, Food Preserv. (F&N) (Ed)	3
		Sociology 52, Rural (Ext)	3
		Electives	

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
*Home Ec. 77, Home Mtg. Pract. (either semester)	3	†Home Ec. 80, Family Life (C&F) (Ext)	3
‡Home Ec. 81, Meth. of Teaching Home Ec. (Ed) (Ext)	3	‡Home Ec. 83, Student Teaching in Home Ec. (either semester) (Ed) (Ext)	3
Home Economics 87, Adv. Clothing Problems (T&C)	3	Home Ec. 84, Spec. Probs. (C&F) (T&C)	3
Home Ec. 89, Diet Therapy (F&N)	3	Home Ec. 88, Appld. Dress Design (T&C)	3
Home Ec. 91, Institutional Foods (F&N)	3	Home Economics 90, Foods & Nutrition Seminar (F&N)	1
Art 75, Appreciation (Ext) (T&C)	3	Home Economics 92, Inst. Foods and Management (F&N)	3
Acct. 25, Prin. of Business Acct. (F&N)	3	Home Ec. 95, Child Nutr. (C&F) (F&N)	3
English 81, Creative Writing (Ext)	3	Art. 78, Renaissance and Mod. (T&C)	3
Speech 91 or 92 (Ext)	3	Electives	
Electives			

* Required of all Home Economics Students.

‡ Acceptable as credits in Education.

† Acceptable as Sociology for American Dietetics Association. (C&F) Recommended for Child Development and Family Life Curriculum.

(F&N) Recommended for Foods and Nutrition and Institution Management curriculum.

(Ed) Recommended for Home Economics Education curriculum.

(Ext) Recommended for Home Economics Extension curriculum.

(T&C) Recommended for Textile, Clothing, and Related Art curriculum.

Other suggested electives for juniors and seniors:

Animal Husbandry 91, Gene-
tics and Eugenics

Art 31, 34

Chemistry 29 or 30

Economics 53, 55

Education 51, 52, 61, 66

English 81, Creative Writing

Food Technology 52

Government 25, American
Journalism (English 85)

Language

Literature

Music 51, 52

Psychology 55 (Ed. credit)

Zoology 25

SCHOOL OF HORTICULTURE

C. L. THAYER, *Acting Dean*

The School of Horticulture offers instruction in the growing and marketing of flowers, fruits, vegetables, and ornamental shrubs; in the breeding and improvement of plants; in the active management and conservation of forests and wildlife; in the design, planting and care of ornamental plantings, and in the processing and technology of food products.

In this broad field of horticulture trained leadership is needed as never before. On the land we must have more well-informed men with the vision to fit developments in their business into a rapidly changing national economy. In the research laboratory we must have more men and women fully competent and eager to push ahead of known procedures and blaze the way to a more effective horticulture geared to better living. In the classrooms of colleges and secondary schools we need more teachers who can orient their material to the economic and social development of the nation and can also bring to bear on current problems all that fundamental science has to contribute. Competent men and women are needed as never before to meet problems of great complexity which call for immediate solution.

FACILITIES FOR INSTRUCTION

The School has available the following facilities for instruction:

GREENHOUSES.—Splendid laboratories for propagating, growing, and studying a wide variety of flowers and vegetables are provided by nearly 20,000 square feet of greenhouse space adjacent to classrooms. The Durfee Plant Houses, in addition, contain a valuable collection of plants which illustrate chiefly the flora of tropical and subtropical regions. These are supplemented by about 5,000 square feet of hotbeds and coldframes.

GARDENS.—Several acres of land are used for the culture of vegetables in great variety, florists' crops, garden flowers, bedding plants, and herbaceous perennials. A nursery is maintained for instruction in the propagation of woody ornamental plants and an excellent collection of plants used in landscape work is available in gardens and campus plantings.

ORCHARDS.—Several hundred varieties of trees and small fruits are maintained in well equipped plantations near at hand. A fruit tree nursery offers the opportunity to become familiar with problems of propagation.

FORESTS.—The Mt. Toby forest of 755 acres and smaller tracts of woodland near the campus afford excellent facilities for field work in Forestry and Wildlife Management. A State Forest Nursery on the campus produces each year hundreds of thousands of seedlings of several species which are used for forest planting throughout the State.

LABORATORIES.—In addition to the facilities listed above a number of laboratories and drafting rooms are maintained by the departments of instruction. Of particular interest are the laboratories devoted to teaching and research in the manufacture, preservation, and examination of food products. Facilities are available for the use of small animals in nutritional work related to the technology of foods. The laboratory is equipped for food freezing and dehydration, and a modern cold storage warehouse is available for special studies.

CURRICULA IN HORTICULTURE

The School includes the Departments of Floriculture, Food Technology, Forestry and Wildlife Management, Landscape Architecture, Olericulture, and Pomology.

Each departmental curriculum is designed to give the student a thorough training in the Sciences and Arts involved most closely in the solution of problems in the field of that department and in the broader field of life in these times. Each curriculum provides a well considered foundation from which increasing effectiveness may be attained with further study and experience. Electives in the junior and senior years provide an opportunity for the pursuit of special interests or for the correction of deficiencies which might later be a handicap.

The program of studies for the first two years is fairly uniform for all curricula and is outlined as follows:

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
Botany 1 or Zoology 1	3	Botany 1 or Zoology 1	3
¹ Chemistry 1, General	3	Chemistry 2, General	3
² Mathematics 7	3	Mathematics 8 or 10	3
³ Hort. 1, Plant Propagation	3	³ Agronomy 2, Soils	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
		Hygiene (women)	1

¹ Majors in Landscape Architecture and Ornamental Horticulture may substitute a Foreign Language or History 5 and 6 for the year course in Chemistry.

² Students who expect to take Calculus in the sophomore year should elect Mathematics 7 and 10. Candidates for the Bachelor of Vocational Agriculture degree take History in place of Mathematics.

³ Food Technology majors will take Mechanical Engineering 1 (Drawing) in place of Horticulture 1. One year of modern language may be substituted for Drawing 1 and Agronomy 2 by special permission. Wildlife Management majors may take Mechanical Engineering 1 (Drawing) in place of Horticulture 1 or a year of modern language in place of Horticulture 1 and Agronomy 2.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	2	English 26, Survey of Lit.	2
Speech 29	1	Speech 30	1
Economics 25 or Psychology 26	3	Psychology 26 or Economics 25	3
A Science Electives	3	A Science Electives	3
Military 25 (men)	6	Military 26 (men)	6
Physical Education 27 (women)	2	Physical Education 28 (women)	2

In making all elections students should be guided by the departmental recommendations for the sophomore year to be found in the following description of junior-senior curricula in Horticulture.

JUNIOR-SENIOR CURRICULA IN HORTICULTURE

Juniors and seniors in Horticulture will elect their major work in one of the following curricula:

FLORICULTURE

C. L. THAYER, *Adviser*

The courses in Floriculture provide for a comprehensive and detailed study of the practices and principles involved in the production, marketing and uses of cut flowers, flowering and foliage plants grown outdoors and under glass. Opportunities available to graduates may include: positions in various fields of commercial floriculture, such as production, wholesale marketing and retailing; employment in nurseries, on private estates and in conservatories; positions in the professional field, including graduate study, teaching in colleges and secondary schools, research and extension work under state, Federal, or other supervision.

It is advantageous for the student to determine, as soon as possible, the type of position for which he wishes to fit himself since the choice of elective courses will depend largely on his decision.

As sophomores majors are advised to take Chemistry 29 and 30 for their Sciences. First semester electives should be Botany 25 and Olericulture 25; second semester Entomology 26 and Floriculture 26.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Flori. 51, Greenhouse Mgt.	3	Flori. 52, Flower Arrangement	3
Flori. 79, Conservatory Plants or	2	Flori. 54, Greenhouse Const.	3
Flori. 81, Herb. Gardens and borders	3	Plant Breeding 52, Genetics	3
Plant Breeding 51, Genetics	3	Botany 51, Plant Pathology	3
Entomology 51, Pests of Special Crops	3	Electives	6
Electives	5-6		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Flori. 75, Commerical	3	Flori. 76, Commercial	3
Flori. 79 or	2	Flori. 82, Seminar	3
Flori. 81	3	Botany 68, Physiology	3
Botany 67, Physiology	3	Electives	8
Electives	8-9		

FOOD TECHNOLOGY

C. R. FELLERS, *Adviser*

The curriculum in Food Technology provides scientific and applied training in the principles concerned with the processing, preservation, and packaging of foods and food products. Both home and commercial methods of food preservation are considered. Practical work includes canning, freezing, dehydration, and fermentation and salting. Methods of manufacture of jams, jellies, fruit juices, and beverages are a part of course work. An effort is made to apply the student's background in chemistry and bacteriology to Food Technology problems and food analysis.

The curriculum gives the student a broad science background with specialized knowledge in food processing and preservation. Special courses are offered for Home Economics majors who plan to teach or do extension work in foods. Major fields open to graduates include: (1) commercial work in cannery, freezer and other plant operation; (2) control and analytical work related to food products; (3) government food inspection and grading; (4) technological work in government and industry.

Ambitious students are encouraged to acquire the background which will enable them to pursue graduate work and research in the application of scientific knowledge to the technology of foods.

The selection of supporting courses depends upon the objective of the student, which should be determined as early as possible.

Food Technology majors should take Physics 25 and 26 and Chemistry 29 and 30 in the sophomore year; also, if possible, Bacteriology 31 and 31A. Students planning to take Physical Chemistry should complete Mathematics 29 and 30.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Food Tech. 51, Introductory	3	Food Tech. 52, Food Prod.	3
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Bacteriology 51	3	Bacteriology 82, Applied	3
Electives		Agr. Engin. 80, Food Engin.	3
		Electives	

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Food Tech. 61, Industrial Technology	3	Food Tech. 62, Industrial Technology	3
Food Tech. 71, Food Science Literature	2	Food Tech. 72, Food Science Literature	2
Food Tech. 91, Exam. of Food Prod.	3	Food Tech. 92, Exam. of Food Prod.	3
Chemistry 79, Physiological or Chemistry 65, Physical Electives	4 3	Food Tech. 82, Confections and Cereal Products or Chemistry 66, Physical Electives	2 3

SUGGESTED JUNIOR-SENIOR ELECTIVES

Public Health 61, 62	Poult. Husbandry	75
A foreign language	Olericulture 73, 74	
Mechanical Engin. 1, 63	Botany 66	
Pomology 77	Home Ec. 30, 52, 54	
Dairy Ind. 75, 77, 52 or 78	Food Tech. 85, 95	
Animal Husbandry 53		

FORESTRY AND WILDLIFE MANAGEMENT

This department offers two curricula, one in Forestry and one in Wildlife Management.

FORESTRY

R. P. HOLDSWORTH, *Adviser*

The curriculum in forestry includes a series of courses in technical forestry sufficiently comprehensive to meet the requirements for general undergraduate preparation in this professional field. With its supporting and cognate courses it substantially meets the requirements for admission to the Junior Forester examination. Should the student upon receiving the Bachelor's Degree follow the highly desirable procedure of continuing his education at a graduate school of forestry, he should receive credit for a considerable proportion of the technical courses accomplished here. The additional time required to obtain the Master of Forestry Degree would normally be one year.

Should the student elect to pursue a pre-professional curriculum in forestry, giving less time to technical forestry courses and more to the basic sciences and cultural subjects, the time required to obtain the Master of Forestry Degree at a graduate school after graduation here will be two years.

Most of the forestry courses are open to students other than those concentrating in forestry, but these courses should be elected only after consultation with the student's major adviser, and the instructor teaching the course.

Sophomore majors in forestry take Economics 25 and either required History or Psychology 26 the first semester. Physics 25, Botany 25 and Civil Engineering 27 should be elected first semester; Botany 28, Physics 26, Forestry 26, and Entomology 26 second semester.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Forestry 53, Silvics	3	Forestry 56, Prin. of	
Forestry 55, Mensuration	3	Silviculture	3
Forestry 59, Protection	3	Forestry 54, Forest Soils	3
Geology 27, Physical	3	Forestry 66, Wood Anatomy	
Plant Pathology 51	3	& Indent.	3
		Wildlife Mgt. 72, Forest-	
		Animal Relationships	3
		Entomology 72, Forest Ent.	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Forestry 81, Regional Silvicult.	3	Forestry 82, Seeding and	
Forestry 57, Forest Policy		Planting	3
& Econ.	3	Forestry 80, Forest Mgt.	3
Forestry 75, Forest Products	3	Forestry 78, Harvesting	3
Electives*		Electives*	

* Two per semester are to be selected from the following:

Botany 67, 68	Accounting 25
Plant Breeding 51, 52	Language
Agronomy 57	History
English 81, 83	Psychology
Land Arch. 25	Chemistry
Geology 28, 51, 52	Mathematics
Agric. Econ. 79	

WILDLIFE MANAGEMENT

R. E. TRIPPENSEE, *Adviser*

The courses in wildlife management are designed both for those who desire a general understanding of the conservation of wild animals and for the professional student who expects to make his living in the wildlife field. Courses in wildlife conservation and management make excellent supporting work for students of public administration, economics, zoology, entomology, and forestry. Particular emphasis is given to the relation of wild animals, their ecology and use on both forest and farm lands.

Students who expect to continue studies for advanced degrees are eligible for graduate work either in the Graduate School at the University of Massachusetts or in other institutions offering graduate work in this field.

Wildlife management is both an applied science and an art, and is concerned with the production and control of wild-animals crops on both wild and cultivated lands. In order to manage land, a knowledge of the origin and management of land is necessary. Thus, work in geology, soils, forestry, and agriculture is included in the training. Fields of specialization include fisheries management, game management, fur production, and control of injurious animals. Related fields include soil conservation, conservation education, and industrial biology.

Studies in wildlife management will be closely correlated with the work carried on by the State Department of Conservation and the U. S. Fish and Wildlife Service. During the junior and senior years trips will be planned to study the

work at the John C. Phillips Wildlife Laboratory at Upton and to attend the New England Game Conference at Boston. Numerous other wildlife projects will also be visited.

Sophomores should elect four courses from the following: Wildlife Management 27, Forestry 26, Bacteriology 31 and 31A, Zoology 35, Chemistry 29, Geology 27, Mathematics 29, Physics 25 and 26, Entomology 26.

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Wildlife Management 71	3	Wildlife Management 70	3
Forestry 55	3	Forestry 56	3
Electives*		Electives*	

SENIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Wildlife Management 73	3	Wildlife Management 74	3
Electives*		Electives*	

* Electives may include the following:

Civil Engineering 27	Botany 26, 81
Agron. 57	English 81, 84
Forestry 53, 80	Entomology 79
History	Accounting 25
Animal Husbandry 91	Agricultural Economics 79
Plant Breeding 51	Bacteriology 64
Chemistry 30, 51, 52	Vet. Science 88
Zoology 80, 86, 81, 83, 87	Land. Arch. 25
Language	Education
Government 25, 28, 62	Psychology

LANDSCAPE ARCHITECTURE

R. H. OTTO, *Adviser*

Instruction in this department has two objectives: first a contribution to general education; second a preparation of students for the professional practice of Landscape Architecture. The department offers optional curricula, (1) Professional Landscape Architecture, and (2) Ornamental Horticulture.

LANDSCAPE ARCHITECTURE

Students following this professional curriculum are prepared to take up work in Landscape Architecture, which leads through field experience or post-graduate study to permanent establishment in the profession.

Sophomores in the first semester elect either Botany 25 or Geology 27 for their Science and take Landscape Arch. 25 (Drawing) and Civil Engineering 27 as electives. In the second semester the Science is either Entomology 26 or Geology 28 and the electives Landscape Arch. 26 (Drafting) and Horticulture 26 (Plant Materials).

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Landscape Arch. 51, Topography	3	Landscape Arch. 52, Elements of Landscape Arch.	3
Landscape Arch. 53, Garden Design	3	Landscape Arch. 54, General Design	3
Hort. 51, Plant Materials	3	Hort. 52, Planting Design	3
Landscape Arch. 79, Construction & Maintenance		Electives	6
alternate with Art 83	3		
Elective	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Landscape Arch. 81, Advanced Design	3	Landscape Arch. 76, Civic Art 3	
Art 75, Art Appreciation	3	Landscape Arch. 83, Advanced Design	3
Art 77, History of Art	3	Art 78, History of Art	3
Landscape Arch. 83, alternate with Landscape Arch. 79	3	Landscape Arch. 80, History and Lit. of Landscape Arch.	2
Elective	3	Electives	4

SUGGESTED ELECTIVES FOR JUNIOR AND SENIOR YEARS

Agronomy 53, 56, Agrostology	Agric. Engin. 51, House Planning
Landscape Arch. 84, Sketching	English 84, Library Research
Botany 67, 68, Plant Physiology	Floriculture 81, Herbaceous Borders
Botany 81, Plant Ecology	

ORNAMENTAL HORTICULTURE

The curriculum in Ornamental Horticulture is suggested for those preferring to follow the horticultural phase of Landscape including (1) nursery work; (2) planting; and (3) maintenance of landscaped areas, such as parks and semi-public institution grounds.

Sophomores in this major will take Botany 25, Civil Engineering 27, Landscape Arch. 25 in the first semester; Entomology 26, Floriculture 26, and Horticulture 26 in the second.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Hort. 51, Plant Materials	3	Hort 52, Planting Design	3
Landscape Arch. 51, Topography	3	Landscape Arch. 52, Construction details	3
Agronomy 53, Turf Grasses	3	Pomology 26, Small Fruits	3
Landscape Arch. 79, Construction & Maintenance	3	Agronomy 56, Turf Mgt.	3
alternate with Botany 81	3	Elective	3
Elective	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Flori 81, Herbaceous Borders	3	Entomology 72, Shade Tree Insects	3
Landscape Arch. 53, Garden Design	3	Pomology 56, Spraying	3
Plant Breeding 51, Genetics	3	Plant Breeding 52, Advanced	3
Forestry 55, Mgt. of Woodlands	3	Botany 51, Plant Pathology	3
Botany 81, Plant Ecology	3	Elective	4
Alternate with Landscape Arch. 79			

OLERICULTURE

G. B. SNYDER, *Adviser*

The courses in Olericulture offer a comprehensive training in the scientific principles and commercial practices related to the culture and marketing of vegetable crops. The studies and training involved are set up to prepare graduates to undertake work in the following fields: (1) practical work

in operating commercial market garden or truck farms or greenhouse establishments, (2) teaching Olericulture and related subjects in college, secondary or high schools, (3) extension work in Horticulture and Agriculture, (4) research studies with state, Federal, or private agencies, (5) state, Federal, or private inspection service agencies, and (6) the wholesale and retail marketing of vegetables and other perishable commodities.

The department of Olericulture has facilities in greenhouses, plant houses, hot beds, machinery and equipment used in production and marketing procedures as well as land to provide the student ample opportunity to become acquainted with modern techniques and practices used in handling vegetable crops. Nearby truck farms, wholesale and retail market outlets, variety trial plots of seed companies and inspection agencies are used to demonstrate laboratory and classroom points of discussion.

The rather broad objectives of the training mean that the selection of supporting courses depends upon the specific field in which the student wishes to engage on graduation. This objective should, therefore, be determined as early as possible during the sophomore year.

Majors in Olericulture should take the following courses during the first semester of the sophomore year: Chemistry 29, Botany 25, and Olericulture 25. In the second semester they should include Chemistry 30, Entomology 26, and Pomology 26.

JUNIOR YEAR			
<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Oleri. 51, Nutrient Requirements	3	Oleri. 52, Environment and Plant Culture	3
Plant Breeding 51, Genetics	3	Oleri. 54, Greenhouse Crops	3
Botany 51, Plant Pathology	3	Botany 68, Plant Physiology	3
Botany 67, Plant Physiology	3	Electives	6-8
Electives	5		

SENIOR YEAR			
<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Oleri. 73, Marketing Practices	3	Oleri. 74, Merchandising of Perishables	3
Oleri. 75, Systematic	3	Oleri. 78, Commercial	3
Oleri. 81, Seminar	1	Oleri. 82, Seminar	1
Entomology 51, Pests of Special Crops	3	Electives	10
Electives	7		

POMOLOGY

A. P. FRENCH, *Adviser*

The Pomology courses provide a comprehensive training in the scientific and commercial principles concerned in the growing and marketing of apples, pears, peaches, plums, cherries, and small fruits. Major fields open to graduates include: (1) practical work in connection with the operation of fruit farms; (2) teaching in college, high school, or secondary schools of agriculture; (3) extension work in

county, state, or nation; (4) research work with state, federal or private connections; and (5) commercial work in connection with the manufacture and sale of such supplies as machinery, packages, and spraying and dusting materials. Certain supporting courses are required and their selection depends upon the objective of the student. That objective should, therefore, be determined as early as possible.

First semester sophomores are advised to elect Botany 25, Chemistry 29, and Olericulture 25. In the second semester they should take Chemistry 30, Entomology 26, and Pomology 26.

The selection of junior-senior electives should be undertaken with the help of the departmental adviser. They will depend for the most part on the interests and objectives of the student and his class record to date. The student who wishes to do college teaching, extension work, or research is advised to secure a broad foundation in science and liberal arts, and to plan to enter a graduate school sooner or later. The student whose objective is growing fruit or teaching in secondary school may need to broaden his training in horticulture and agriculture and, again, will need all the science and liberal arts that can be included in the program.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Pomology 53, General	3	Pomology 56, Spraying	3
Pomology 75, Systematic or	4	Botany 68, Physiology	3
Pomology 77, Commercial	3	Electives	
Botany 51, Plant Pathology	3		
Botany 67, Physiology	3		
Electives			

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Pomology 81, Advanced	3	Pomology 82, Advanced	3
Pomology 75, Systematic or	4	Pomology 84, Seminar	1
Pomology 77, Commercial	3	Electives	
Pomology 83, Seminar	1		
Plant Breeding 51, Genetics	3		
Electives			

DIVISION OF MILITARY SCIENCE AND TACTICS RESERVE OFFICERS' TRAINING CORPS

COLONEL WILLIAM N. TODD, JR., *P M S & T, Head*

LT. COLONEL FRANCIS W. NYE, *Assistant P M S & T*

MAJOR HOWARD C. PARKER, *Assistant P M S & T*

Under act of Congress, July 2, 1862, the College was required to provide a two-year course in military instruction under a regular army officer. All able-bodied four-year male students are required by the University to take this course. Under act of Congress, June 3, 1916, as amended by act of Congress, September 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following World War I, under an act of Congress, July 19, 1918, the Reserve Officers' Training Corps was in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics. Beginning with the fall term, 1920-21, the infantry unit of the Reserve Officers' Training Corps was converted into a horse cavalry unit. The cavalry unit continued training until June, 1943, at which time the Advanced Course ROTC was discontinued for the duration of World War II. From September, 1943 through June, 1946 the Reserve Officers' Training Corps conducted courses in the basic course, branch immaterial only. In September, 1946, the Advanced Course ROTC was reinstated with an Armored Cavalry unit and an Air Corps unit.

The primary objective of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions and to produce junior officers who have the qualifications and attributes essential to their progressive and continued development as officers in the Army of the United States. It is intended to attain the objective during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers.

All male candidates for a degree in the four-year course, except veterans of World War II, must take the basic course of at least three hours a week of military training for two years. Veterans of World War II are not required to take the basic course, but are eligible to apply for the Advanced Course.

The courses for the freshman and sophomore years (basic course) will not be specialized by arm or service. The course of instruction includes theoretical and practical work in all phases of military science, such as military organization, hygiene and first aid, weapons, maps, military administration, military law and boards, and leadership, drill and exercise of command. Approximately forty per cent of the course is classroom and sixty per cent practical work.

Students who are approved by the president of the University and the professor of military science and tactics may elect to take the advanced course in their junior and senior years and may enroll in either the armored cavalry unit or air corps unit. Advanced students will be commissioned in the organized reserve corps, in the respective branch, upon graduation. Honor graduates are offered a commission as 2nd Lieutenants in the Regular Army. Other graduates may elect to serve for two years extended active duty and by this means win a commission in the Regular Army.

The advanced course, in either branch, consists of at least five hours per week, and an advanced summer camp of about six weeks during the summer vacation between the two years of the advanced course. Students taking the advanced course are paid by the War Department at a rate equivalent to the value of the garrison ration which at the present time is 79c per day, or about \$24.00 per month. Advanced students are paid the pay of the 7th grade (private) while at summer camp.

All students are provided with a complete officers' uniform by the Army. A deposit of \$30.00 is required to cover cost of loss or damage to any articles issued.

DIVISION OF PHYSICAL EDUCATION

C. S. Hicks, *Head*

The Division of Physical Education includes the Departments of Athletics, Student Health, Physical Education for Men, and Physical Education for Women. It offers one major, that in Physical Education for Men.

INTERCOLLEGIATE ATHLETICS

C. S. Hicks, *Director*

The following men are in charge of the coaching of the intercollegiate teams:

Thomas W. Eck, Head Coach of Football, and in charge of Publicity; Lorin E. Ball, Assistant Coach of Football and Coach of Basketball; L. L. Derby, Coach of Track and Cross Country; L. E. Briggs, Coach of Soccer; Joseph R. Rogers, Jr., Coach of Swimming; Earl Lorden, Assistant Coach of Football and Coach of Baseball; Sidney W. Kauffman, Assistant Director of Athletics and in charge of Intramural Sports; Stanley F. Salwak,, Coach of Tennis and Trainer.

STUDENT HEALTH

DR. E. J. RADCLIFFE, *Head*

Regulations in regard to Student Health are outlined on page 64.

All freshmen are required to attend a series of lectures on personal hygiene. For men, these lectures are included in the Military program; for women, they are designated as Hygiene, and taught by the Health Service staff.

PHYSICAL EDUCATION FOR MEN

H. M. GORE, *Adviser*

The work in the Department of Physical Education for Men includes required and elective physical fitness activity courses for all four years; and the opportunity to major the last two years in Physical Education; or to minor in Physical Education, Teacher-coaching or Physical Recreation.

The physical fitness activities courses for men, which are required the first two years and urged upon the upperclassmen are planned to help every man student to at least meet accepted reasonable minimum standards of physical fitness; and then, through regularity and continuity of progressively planned exercise, maintain good physical condition throughout his college career. Every freshman must pass a reasonable physical fitness rating and learn to swim.

The majors and minors in Physical Education are so planned as to qualify volunteer and professional leaders and instructors in Physical Education, Athletics, Health and Safety Education, and Physical Recreation for service and adult organization, organized summer camps, public service and industrial groups, schools and colleges.

The outline of the Physical Education Major follows. It is contemplated that Physical Education majors will be well trained in general scientific and cultural subjects as well as to be themselves physically fit. They are urged to elect advanced Military and courses in Education. Those planning on Teacher-Coaching should take additional work in their particular subject matter fields.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	3	English 2, Composition	3
Mathematics 7, Algebra and Trigonometry	3	Mathematics 8, Algebra	3
Physical Education 5, Survey	3	Physical Education 22, First Aid	3
Military 1	3	Military 2	2
Physical Education 3, Activity	1	Physical Education 4, Activity	1
<i>Elect two:</i>		<i>Elect two:</i>	
Chemistry 1, General	3	Chemistry 2, General	3
Botany 1, Introductory	3	Zoology 1, Introductory	3
History 5, Mod. European Civiliz.	3	History 6, Mod. Europ. Civiliz.	3

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Literature	2	English 26, Literature	2
Speech 29	1	Speech 30	1
Economics 25, Elements	3	Psychology 26, General	3
Physical Education 45, History	2	Physical Education 42, Aquatics and Water Safety	3
Physical Education 33, Activity	1	Military 26	2
Physical Education 43, Officiating	1	Electives (one to be a science)	6
Military 25	2	<i>Electives:</i>	
Electives (one to be a science)	6	Zoology 35	3
<i>Electives:</i>		Chemistry 32, Organic	3
Bacteriology 31, Introductory	2	Physics 26, Light, Electricity	4
Bacteriology 31A, Intro. Lab.	2	Language	3
Chemistry 29, Qualitative	4	History	3
Chemistry 31, Organic	3		
Physics 25, Mech., Sound, Heat	4		
Physical Ed. 57, Camping	3		
Language	3		
Government 25, American Govt.	3		

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Physical Ed. 53, Elem. Schools	3	Physical Ed. 54, Special Methods	3
Physical Education 51, Coaching	3	Physical Ed. 52, Coaching	3
Physical Education 63, Activity	1	Physical Ed. 76, Anatomy	3
Electives	9	Physical Ed. 64, Activity	1
		Electives	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Physical Ed. 71, Spec. Problems	3	Physical Ed. 56, Administration	3
Education 85, Prac. Teach.	3	Physical Ed. 78, Kinesiology	3
Physical Ed. 83, Activity	1	Physical Ed. 84, Activity	1
Electives	9	Electives	9

To comply with state certification requirements in education, Physical Education majors must take Education 52, Methods; Education 83, Secondary; Educational Psychology 55; and Education 85, Practice Teaching. It is recommended, for elective education courses, that Education 88, Curriculum, be first choice and if impossible to schedule it, that Education 53 Tests and Measurements be taken.

PHYSICAL EDUCATION FOR WOMEN

RUTH J. TOTMAN, *Adviser*

The courses in Physical Education for Women are planned to provide recreative activity, to develop body grace and efficiency, and to increase health and vigor. No major is available.

The first and second year women students are required to take Physical Education three times a week and are given two credits for each semester of satisfactory work. Third and fourth year students may elect Physical Education 61-62 or 81-82.

A physical examination is given before classes begin in the fall. Girls who are restricted from unlimited activity are placed in classes suitable to their ability. Girls who are restricted from all class activity are assigned to rest periods three times a week and receive their regular Physical Education credit for satisfactory attendance. A similar rest program is substituted for the regular activity program when girls are temporarily incapacitated.

DIRECTORY OF COURSES

This section contains a list of courses offered in the regular sessions of the University. Course descriptions are arranged alphabetically according to subject matter fields. If any course cannot be found readily, refer to the General Index in the back of the catalogue. A separate bulletin will outline those available during the summer. The University reserves the right to withdraw any course for which an insufficient number of students enroll.

Courses are designated by numbers as follows: freshman 1-24 inclusive; sophomore 25-49 inclusive; junior 50-74 inclusive; senior 75-99 inclusive. Odd numbers designate courses given in the first semester, even numbers those offered during the second. Credit is indicated in terms of semester hours. Where possible, the class schedule follows the course description. A complete schedule of class hours is published at the beginning of each semester.

Students are referred to the section on Divisions of Study and Curricula for a statement of graduation requirements and majors available.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

PROFESSOR LINDSEY, PROFESSOR BARRETT,
ASSISTANT PROFESSOR RUSSELL, MR. CALLAHAN

26. (II) ECONOMICS OF AGRICULTURAL PRODUCTION.—

This course considers the principles of production economics. An analysis of specialization, comparative advantage, diminishing, constant, and increasing costs and returns applied to the individual establishment as well as to the nation. A careful study of the combination of the factors of production is made considering the individual's adjustment when operating under monopolistic competition, laissez-faire, and monopoly. Finally, dynamic and static factors are considered in relation to their effects on the individual's production, on the economy of cities and nations, and on the international economy.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. RUSSELL.

Prerequisite, Economics 25.

55. (I) MARKETING FARM PRODUCTS.—Not open to students who have taken or are taking Marketing 53. An analysis of present and past systems of assembling, transporting, distributing, and grading agricultural products. Such aspects as the adjustment of production and consumption, price formation, channels of distribution, price differentials and margins,

public policy, market reporting and forecasting, and a study of the marketing of major agriculture products are considered. Geographic, future, and quality differentials are studied from the agricultural and commercial standpoint.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 Tu. Th. 2 hours by arrangement. Mr. RUSSELL.

56. (II) THE FUNDAMENTALS OF COOPERATION.—A study of the philosophy and principles of cooperation in Europe and in the United States. The history of cooperation, legal consideration, management, financing, membership relations, methods of formation, sales methods and policies are given full attention. Progress in the cooperative marketing of different agricultural products is studied.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. RUSSELL.

57. (I) AGRICULTURAL CREDIT AND LAND APPRAISAL (1950-51).—A study of the development, use, functions, and operations of public and private credit institutions which are available to agriculture. Special emphasis is given to the practical aspects of credit policy and land appraisal. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. LINDSEY.

71. (I) AGRICULTURAL ECONOMIC THEORY (1949-50).—The course is a comparative and critical study of the significant contributions of the leading economists to the theory of agricultural economics from the time of Adam Smith to the present. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. LINDSEY.

76. (II) FARM ORGANIZATION AND MANAGEMENT.—This course analyzes the functions of the farmer as a business proprietor. Both the external and internal economic forces affecting the farm business are considered, such as selection and combination of factors of farm production, choice and combination of farm enterprises, the economical use of funds, nature of farming costs and adjustments to price changes. The use of farm records and accounts as a basis for planning and budgeting is emphasized. "Scientific management" as applied to efficient farm technique is taken up. The last part of the semester the course will be given over to the specific study of selected farms and the practical application of the principles and practices already discussed. Field trips are required. The approximate expense for travel is five dollars. 2 class hours; 1 2-hour and 1 4-hour laboratory period.

Credit, 4.
Prerequisite, Agricultural Economics 26. Mr. BARRETT.

78. (II) PRINCIPLES AND PROBLEMS OF LAND ECONOMICS.—A study of the major contributions by outstanding economic writers to theoretical land economics; a review of American land policies; a presentation of the principles, techniques, and objectives involved in modern land use planning; and a discussion of contemporary land problems in the United States.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mr. LINDSEY.

79. (I) PRINCIPLES AND METHODS OF STATISTICS.—Methods of collecting, analyzing, interpreting, and presenting statistical data. Sampling principles, averages, dispersion, measures, index numbers, time series and simple correlation are specific fields covered. Practical problems in agriculture and business are given in the laboratory.

1 class hour; 2 2-hour laboratory periods.

1:00-1:50 W.; 1:00-2:50 M. F. Mr. LINDSEY, Mr. RUSSELL.

Credit, 3.

80. (II) ADVANCED STATISTICS.—This course is primarily devoted to linear and curvilinear multiple correlation analysis. Machine and shortcut graphic methods are used. Some time will also be devoted to probability and analysis of variance.

1 class hour; 2 2-hour laboratory periods.

1:00-1:50 W.; 1:00-2:50 M. F.

Credit, 3.

Mr. LINDSEY.

83. (I) ADVANCED FARM OPERATION.—For seniors specializing in agriculture; others by permission of instructor. A study of the efficiency of operations on a specific farm.

3 hours or equivalent.

Hours by arrangement.

Credit, 3.

Mr. BARRETT.

89. (I) 90. (II) PROBLEMS IN AGRICULTURAL ECONOMICS.—This course may be conducted as a seminar or individuals may be assigned specific problems in price, credit or market analysis. It may also cover problems in land use and farm management.

Hours by arrangement.

Credit, 1-3.

THE DEPARTMENT.

AGRONOMY

Professor SIELING, Associate Professor DICKINSON, Assistant Professor THAYER, Assistant Professor EVERSON, Mr. ZAK, Mr. RUSSELL.

2. (II) SOILS.—This is an elementary course relating soils and their management to crop growth. This course is designed to give the student a broad background in soil science and its direct application to practical field problems. The course itself is presented with the object of introducing to the student the properties of soils and their influence upon

the production of crops. The laboratory work consists of investigation of the fundamental characteristics of soil and basic principles of fertilizer and liming practices.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu. Th.; 3:00-4:50 W. or Th.

Mr. EVERSON, Mr. ZAK, Mr. RUSSELL.

51. (I) FIELD CROPS.—A study of the field crops of the United States which will include their uses and improvement, with their soil and climatic requirements. Emphasis will be given to the best farm practices of the northeastern states as to rotation, liming, fertilizing, seeding methods, tillage, disease and insect control, and to methods of harvesting and storage. As an individual problem, each student must make a detailed plan of crop production for the actual conditions of some New England farm.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 Th.

Mr. THAYER.

52. (II) SOIL UTILIZATION.—The relationship of climate and native vegetation to the broader aspects of soil formation is described. Man's use of land resources is connected to show how the agricultural background of settlers have been active in soil use and abuse. Soil erosion control and its significance to permanent agriculture is considered.

3 class hours. Credit, 3.
8:00-8:50 M. W. F.

Mr. EVERSON.

57. (I) SOIL FORMATION.—The first part of this course considers those physical, chemical, biological, climatic and geological factors involved in soil formation. The relationship of these factors to the kinds of soils formed in the United States is discussed.

3 class hours. Credit, 3.
Mr. EVERSON.

77. (I) CROP IMPROVEMENT.—Theory and practice of the improvement of field crops by breeding and selection. 2 class hours; 1 2-hour laboratory period. Credit, 3.

Hours by arrangement. THE DEPARTMENT.
Prerequisites, Agronomy 51, Pomology 51, 52.

78. (II) FERTILIZERS.—The primary purpose of this course is to relate soils and fertilizers to plant growth. Studies are made of fertilizer practices in the United States and Europe. In the early part of the course consideration is given to the history of fertilizer development, with special emphasis upon early discoveries and causes of failure in early research. Later in the course, studies are made of factors which relate fertilizers and soils to plant growth. Fertilizer formulation

technology and practice are considered in detail in the laboratory phase of this course.

2 class hours; 1 2-hour laboratory period.
9:00-9:50 Tu. Th.; 1:00-2:50 Th.

Credit, 3.
Mr. EVERSON.

79. (I) SOIL PHYSICS.—For seniors specializing in agronomy. The factors in soil which control tilth and energy relationships and the laws of physics which govern these factors are discussed. This includes heat, light, color, particle size and charge, water and gas movement, energy relationships and other physical factors effecting changes in the soil. The laboratory is used to familiarize the students with various methods used in measuring these important physical factors.

1 class hour; 2 2-hour laboratory periods.
Credit, 3.
Mr. EVERSON.

81. (I) 82. (II) SPECIAL PROBLEMS IN AGRONOMY.—For seniors specializing in agronomy. This course is designed to acquaint students with agronomic research methods and practical agronomic procedures.

3 2-hour laboratory periods.
Credit, 3.
Mr. SIELING.

Agrostology

53. (I) AGROSTOLOGY.—All factors that influence the successful growing of fine turf grasses are studied and correlated to enable the student to have a practical working knowledge of the construction and maintenance of lawns, sports, highway, airport and cemetery turf.

2 class hours; 1 2-hour laboratory period.
Credit, 3.
Mr. DICKINSON.

56. (II) AGROSTOLOGY.—This course considers fine turf management as a business and profession. Emphasis is placed on diagnosis and treatment of turf failures; the selection of equipment and supplies and client approach. Field trips and practical exercises are arranged.

1 class hour; 2 2-hour laboratory periods.
Credit, 3.
Mr. DICKINSON.

ANIMAL HUSBANDRY

Professor RICE, Associate Professor FOLEY, Assistant Professor COWAN, Assistant Professor HALE, Mr. SWANSON

1. (I) AGRICULTURE.—This course is designed to provide the student with a perspective of the whole field of agriculture both in the old and the new world. The social interrelationships of agriculture, population trends, standards of living, rural health, recreation, etc., are considered as well as the functions of farmers' organizations. Finally, the manifold influences of political trends, tariffs, systems of taxation and the functions of rural institutions, such as the church, the

school, the library, on the development of cultural intellectual patterns in rural living are discussed.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 M. or F. THE DEPARTMENT.

26. (II) BREEDS OF LIVESTOCK AND DAIRY CATTLE JUDGING.—This course considers the economic desirability of thirty breeds of domestic livestock. The origin, history, characteristics and distribution of the breeds of cattle, sheep, swine, and horses commercially important in the United States will be discussed. During April and May trips will be made on Saturdays to outstanding herds of dairy cattle in New England. The three highest ranking students in advanced judging will represent the College in the Intercollegiate Dairy Cattle Judging Contest at the Eastern States Exposition in Springfield, in September.

2 class hours; 1 laboratory period. Credit, 3.
11:00-11:50 Tu. Th.; 3:00-4:50 F., Feb. and Mar.; 8:00-12:00
S., Apr. and May. Mr. SWANSON.

51. (I) NUTRITION OF FARM ANIMALS.—This course will present the fundamental principles of animal nutrition together with the identification, composition, properties and uses of the common feed stuffs. The application of these basic principles in calculating balanced rations for all classes of livestock will be stressed, followed by practical feeding problems assigned outside the classroom. Feeding practices in use with the College livestock will be analyzed and demonstrated.

3 class hours; 1 2-hour laboratory period. Credit, 4.
8:00-8:50 M. W. F.; 3:00-4:50 W. Mr. SWANSON.

53. (I) ELEMENTS OF MEAT PACKING.—For Department majors only. The lectures will discuss the development of the modern packing industry, the history of meat inspection, the principles of meat preservation and the opportunities in this field. Laboratories include the classification of cattle, calves, sheep, and swine into proper market classes and grades and slaughtering and dressing operations with animals provided by the college farm. Wholesale and retail cuts are prepared. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about ten dollars.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 or 3:00-4:50 M. F. Mr. HALE.

54. (II) MEAT PROCESSING.—For students not majoring in Animal Husbandry, by permission of the instructor. A few periods will be devoted to a discussion of the meat packing industry and to the preserving and care of meat products. The remainder will be spent on the classification of meat

animals with practice slaughtering and the making of whole-sale and retail cuts with stress on identification of retail cuts. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about ten dollars.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 Tu. Th.

Mr. SWANSON.

56. (II) BEEF AND SHEEP PRODUCTION.—This course considers the historical and economic development, present status and probable future trends of beef and sheep production in the United States, especially New England. Consideration will be given to types of production; systems and methods of feeding, management and marketing. In the laboratory, practice will be obtained in fitting and showing as well as certain practical techniques such as dehorning, ear-tagging, castrating, foot-trimming, shearing, etc., and the treatment and prevention of external and internal parasites as well as common ailments.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 3:00-4:50 M. or F.

Mr. COWAN.

56A. (II) GENERAL LIVESTOCK JUDGING AND FIELD TRIPS.—This course is given in conjunction with Animal Husbandry 56 and consists of practice in judging and selecting beef, cattle, sheep, horses, and swine. Throughout the spring, field trips are made to nearby livestock farms and breeding establishments. The five highest ranking students in judging will represent the University in the Intercollegiate Livestock Judging Contest at Eastern States Exposition the succeeding fall.

1 4-hour laboratory period.

Credit, 1.

8:00-12:00 S.

Mr. COWAN.

72. (II) MEAT JUDGING.—This course deals with the classification, grading and judging of carcasses and cuts of beef, veal, lamb and pork. Class work will be carried on at Amherst and nearby packing and distributing plants. The team to represent the University in the Intercollegiate Meat Judging Contest held in connection with the Eastern States Exposition will be chosen from students in this course.

1 4-hour laboratory period.

Credit, 1.

1:00-4:50 Tu.

Mr. HALE.

Prerequisites, Animal Husbandry 51 and 53 or permission of instructor.

74. (II) ADVANCED MEATS.—This course deals with the advanced techniques in preparing, preserving, and utilizing the various meat products from cattle, sheep and swine.

2 2-hour laboratory periods.

Credit, 2.

Mr. HALE.

Prerequisite, Animal Husbandry 53 or 54 and permission of instructor.

75. (I) **ANIMAL BREEDING.**—This course is planned to acquaint the student with the facts of reproductive physiology, with the facts and theories of modern genetics, and to show how such knowledge may be utilized through genetic analysis, selection, and systems of breeding for the creation of more beautiful and more efficient animal types.

3 2-hour periods.

1:00-2:50 M. W. F.

Credit, 4.

Mr. RICE.

78. (II) **DAIRY CATTLE PRODUCTION.**—This is an intensive course covering all phases of dairy cattle and milk production. It affords an opportunity to seek the solution to the economic, nutritional, genetic, and managerial problems concerned in successful dairying.

4 2-hour laboratory periods.

8:00-9:50 Tu. Th.; 1:00-2:50 W., and Tu. or Th. Mr. FOLEY.

Credit, 4.

79. (I) **HORSE AND SWINE PRODUCTION.**—This course is the same as Animal Husbandry 56 except that it deals with horses and swine instead of beef and sheep.

2 class hours; 1 2-hour laboratory period.

8:00-8:50 Tu. Th.; 3:00-4:50 M. or F.

Credit, 3.

Mr. COWAN.

79A. (I) **ADVANCED LIVESTOCK JUDGING.**—This course is devoted entirely to beef, sheep, horse, and swine judging and selection. Field trips will be made to breeding establishments and a team will be selected to represent the University at the Intercollegiate Livestock Judging Contest at the International Livestock Exposition in Chicago and at any other contests in which the University may occasionally or regularly participate.

1 4-hour laboratory period, first half of semester. Credit, 1.

8:00-12:00 S.

Mr. COWAN.

Prerequisite, Animal Husbandry 56A or permission of instructor.

81. (I) **SEMINAR.**—For Animal Husbandry majors.

1 2-hour laboratory period.

3:00-4:50 W. or Th.

Credit, 1.

Mr. FOLEY.

82. (I) **SEMINAR.**—For Animal Husbandry majors.

1 2-hour laboratory period.

3:00-4:50 Tu. or Th.

Credit, 1.

Mr. RICE.

83. (I) **ADVANCED MEAT JUDGING.**—This course is a continuation of Course 72. The team to represent the University in the Intercollegiate Meats Judging Contest held in connection with the International Livestock Exposition will be chosen from students in this course.

1 4-hour laboratory period, first half of semester. Credit, 1.

1:00-4:50 Tu.

Mr. HALE.

Prerequisite, Animal Husbandry 72 and permission of instructor.

91. (I) GENETICS AND EUGENICS.—This course, open to students other than those specializing in animal husbandry, deals with the general problems concerned in human reproduction and inheritance. The main topics studied will consist of the physiology of reproduction, the physical basis of inheritance, and the mode of transmission of human characteristics. Consideration will also be given to such questions as the causes of variation, the relative importance of genetic and environmental influences, the mechanism of sex determination as well as population trends, differential birth rates, sterilization, and kindred eugenic problems.

3 class hours.

9:00-9:50 M. W. F.

Credit, 3.

Mr. RICE.

BACTERIOLOGY AND PUBLIC HEALTH

Professor BRADLEY, Associate Professor GARVEY, Associate Professor FRANCE, Assistant Professor PERRIELLO, Assistant Professor LIPOVSKY, Mr. LARKIN, in cooperation with Dr. WALTER W. LEE, State District Health Officer; Mr. _____ and Mr. ERNEST A. SNOW of the Division of Sanitary Engineering of the Massachusetts Department of Public Health.

31. (I) and (II) INTRODUCTORY BACTERIOLOGY. LECTURES AND DEMONSTRATIONS.—Designed to present to students interested in general science, agriculture, horticulture, and home economics the fundamental concepts of bacteriological science; make microorganisms real and significant; and demonstrate their importance in the problems of agriculture, general science, industry, public health, and medicine. This course is designed to accompany Bacteriology 31A, but may be elected without it. When elected separately this course will not satisfy the sophomore science requirement and cannot be offered as a prerequisite for other advanced courses in bacteriology.

2 class hours.

Credit, 2.

2:00-2:50 M. F. or Tu. Th. Mr. BRADLEY or Mr. LIPOVSKY.

31A. (I) and (II) INTRODUCTORY BACTERIOLOGY. LABORATORY.—The work covers the use and care of the compound microscope, the preparation of culture media, methods of sterilizing equipment, the isolation and aseptic handling of pure cultures, simple and differential staining, bacterial classification and differential studies on type species of pathogenic and non-pathogenic bacteria. Designed to accompany Bacteriology 31.

2 2-hour laboratory periods.

Credit, 2.

Mr. BRADLEY, Mr. LIPOVSKY, or Mr. LARKIN.

Prerequisite, Bacteriology 31, previously or concurrently.

51. (I) 52. (II) ADVANCED BACTERIOLOGY.—A continuation of introductory bacteriology. Studies on bacterial metabolism and the influence of environmental factors on

growth and viability. The identification and differentiation of bacterial species by morphological, cultural, physiological, and serological studies; disinfectants and antibiotics. The combined courses give to the student not only a comprehensive picture of various forms of existing bacteria but develop a specialized technique for their cultivation, isolation, and identification.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 Tu. Th.

Miss GARVEY or Mr. LIPOVSKY.

Prerequisite, For 51, Bacteriology 31A; for 52, Bacteriology 51.

54. (I) and (II) WATER AND SEWAGE BACTERIOLOGY.—Elementary bacteriology with emphasis placed upon the importance of bacteria found in water and sewage. Work will include routine analysis used in the examination of water and sewage and in the laboratory control of water and sewage treatment plants.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 Tu. Th.

Mr. PERRIELLO.

Prerequisite, Civil Engineering 77 or permission of the instructor.

81. (I) GENERAL APPLIED BACTERIOLOGY.—This course is designed to give the student a working knowledge of routine and special tests used in present day applied bacteriology. Subjects receiving consideration are: methods for determining the sanitary quality of milk and milk products, water and shellfish; eating and drinking utensils; and air.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F. or 1:00-3:50 W.; 9:00-11:50 S. Mr. FRANCE.

Prerequisite, Bacteriology 51 or permission of the instructor.

82. (II) FOOD BACTERIOLOGY.—Consideration will be given to (1) bacteriological principles which apply to the preservation, fermentation and spoilage of foods, (2) the sanitary examination of foods, (3) the causes of food poisoning, and (4) microbiological assays.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F. or Tu. Th.

Miss GARVEY or Mr. LIPOVSKY.

Prerequisite, Bacteriology 51 or permission of the instructor.

85. (I) BACTERIOLOGY (IMMUNOLOGY).—Admission by permission of the instructor. This course includes consideration of host reactions which favor the prevention and cure of disease; qualitative and quantitative estimations of toxins and antitoxins; the use of biological products such as antigens and immune sera in differential bacteriology and in disease diagnosis; and a consideration of isohemagglutinins as determinants of blood groups.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F.

Miss GARVEY.

90. (II) **SANITARY BACTERIOLOGY.**—A detailed study of public health laboratory methods. Practical application of methods will be made through field studies.

1 4-hour and 1 2-hour laboratory period.

Credit, 3.

1:00-4:50 M., 1:00-2:50 F.

Mr. FRANCE.

Prerequisite, Bacteriology 81.

92. (II) **CLINICAL LABORATORY METHODS.**—This course is designated for students majoring in medical technology. The purpose of the course is to familiarize the student with routine clinical laboratory procedures.

1 4-hour laboratory period.

Credit, 3.

1:00-4:50 W., 3:00-4:50 F.

Mr. FRANCE.

Prerequisites, Bacteriology 85; Zoology 35, 69.

Public Health

61. (I) 62. (II). **GENERAL AND COMMUNITY SANITATION.**—A study of the problems of general and community sanitation. Subjects discussed will include insect and rodent control, housing and slum clearance, ventilation, lighting, bathing places, sanitation of eating utensils, nuisances, camp sanitation industrial hygiene, water supplies, sewerage and sewage, refuse and garbage, food and milk sanitation.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th., 12:00-12:50 F. or 10:00-10:50 M. W. F.

Mr. BRADLEY or Mr. PERRIELLO.

64. (II) **MICROSCOPY OF WATER.**—A study of microscopic forms of life exclusive of the bacteria. Counting and control of plankton in potable waters. Elements of limnology.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 8:00-9:50 or 10:00-11:50 W.

Mr. SNOW.

Prerequisite, Bacteriology 31A.

66. (I) and (II) **PRINCIPLES OF SANITATION.**—The application of sanitary engineering and related sanitary sciences to health problems in the environment of urban and rural communities.

2 class hours.

Credit, 2.

11:00-11:50 Tu. Th.

Mr. PERRIELLO.

Prerequisite, Civil Engineering 77 or permission of the instructor.

84. (II) **PUBLIC HEALTH ADMINISTRATION.**—Admission by approval of the instructor. The organization, function, and administration of governmental health agencies; the relationship of official and volunteer health agencies; preparation and presentation of lectures, demonstrations, and exhibits. Public health laws, regulations, and sanitary codes, their origin and enforcement.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. PERRIELLO.

86. (II) FIELD STUDIES IN SANITATION.—Trips will be taken into the field for the observation of public health practices in sewerage; sewage treatment and disposal; the production and purification of public water supplies; housing and slum clearance; insect and rodent nuisances; milk production, handling, and distribution; garbage and refuse collection and disposal; slaughter houses and rendering plants; cold storage warehouses; and bakery and restaurant sanitation. A comparative study of urban and rural services will be made. Although transportation will be furnished, students are expected to finance their own meals.

1 class hour; 1 4-hour laboratory period.

Credit, 2.

Hours by arrangement.

Mr. BRADLEY.

Prerequisites, Public Health 61 and 62.

88. (II) EPIDEMIOLOGY AND COMMUNICABLE DISEASE CONTROL.—Admission by approval of the instructors. Consideration of the factors involved in the spread of infections; a detailed discussion of the communicable diseases, their distribution, cause, epidemiology, and means of prevention and control. The use of vaccines, serums and drugs for prevention and treatment. Mass immunization programs.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. LEE.

BOTANY

Professor OSMUN, Professor TORREY, Associate Professor HODGE, Associate Professor KOZLOWSKI, Assistant Professor BANFIELD, Mr. SPENCER, Mr. ARMY, Mr. DUNTON.

1. (I) and (II) INTRODUCTORY BOTANY.—The course sets forth a body of facts dealing with the morphology and physiology of plants which is not only a foundation for future professional work in biological science, but of intrinsic value to the educated layman. The topics of seed germination, ecological adaptations, floral structures, taxonomy, botanical history, cytology, wood-anatomy, plant physiology, and plant reproduction receive appropriate elementary treatment. The lectures attempt to interpret the facts of plant structure and function in the light of the major biological principles.

2 class hours; 2 2-hour laboratory periods.

Credit, 3.

Mr. TORREY, Mr. HODGE, Mr. SPENCER.

25. (I) CRYPTOGAMIC BOTANY.—Selected forms typifying the slimemolds, bacteria, algae, fungi, lichens, liverworts, mosses and fernworts. The course has a two-fold purpose: (1) it is intended for students who desire to extend their knowledge to the principal branches of the plant kingdom, thus rounding out a general course of which Course 1 constitutes the first part; (2) it is also planned as an introduction to certain advanced courses for which it is prerequisite.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. OSMUN, Mr. SPENCER.

Prerequisite, Botany 1.

26. (II) **TAXONOMIC BOTANY.**—Designed to acquaint the student with the local flora by a general study of the tracheate plants (lycophods, horsetails, ferns, gymnosperms, and angiosperms). Laboratory work will include the study of native trees and shrubs in the winter condition; the collection and identification of New England plants including the preparation of an herbarium of about 100 species. Competition for the Hills' Herbarium Prizes will be open to members of this course. Necessary materials for the course require the expenditure of approximately fifteen dollars.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Botany 25.

Mr. HODGE, Mr. OSMUN.

28. (II) **PLANT PHYSIOLOGY.**—Only for students intending to major in forestry. The processes occurring in plants with special emphasis on tree physiology and its relation to forestry problems.

3 class hours.

Credit, 3.

Mr. KOZLOWSKI.

Prerequisite, Botany 25.

51. (I) **PLANT PATHOLOGY.**—A basic course in plant pathology dealing with the nature, cause and control of plant disease. Particular attention is given to disease symptoms, the phenomena of infection and of parasitism, the sources of inoculum, the agents of disease transmission, the relation of environment to disease incidence and development and to general principles of plant disease control. The laboratory phase is devoted to intensive study of a relatively few representative diseases induced by bacteria and fungi of the various classes.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 3:00-4:50 Tu. Th.

Mr. BANFIELD.

Prerequisite, Botany 25.

52. (II) **ADVANCED PLANT PATHOLOGY (1948-49).**—An extension of Course 51. The objective is that of providing the student with a general knowledge of the more common and representative plant disease problems. Students are granted the option in the laboratory of specializing in disease problems in their major field of interest. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 3:00-4:50 Tu. Th.

Mr. BANFIELD.

Prerequisite, Botany 51.

58. (II) **MICROTECHNIQUE.**—A course in the preparation of microscopic mounts including the celloidin and paraffin

methods and involving the use of microtomes and of differential stains.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 Tu. Th.

Mr. TORREY.

Prerequisite, Botany 25.

59. (I) 60. (II) THE ANGIOSPERMS (1948-49).—Alternate with Courses 61 and 62. An evolutionary treatment of the angiosperm orders and families largely from the standpoint of floral and fruiting structures. Fundamental to intelligent determinative and taxonomic work on seed plants. Laboratory studies on types from the most important plant families. The department herbarium and greenhouses supply material of important tropical forms.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. TORREY.

Prerequisite, Botany 1.

61. (I) 62. (II) THE COMPARATIVE ANATOMY OF GREEN PLANTS (1949-50).—Alternate with Courses 59 and 60. The lectures deal with the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter, the department possesses excellent sets of micropreparations and lantern slides.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. TORREY.

Prerequisite, Botany 25.

64. (II) SYSTEMATIC MYCOLOGY (1949-50).—Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection, and preservation of fungi; systems of classification; collateral reading. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 Tu.; 3:00-4:50 Tu. Th.

Mr. BANFIELD.

Prerequisite, Botany 25.

65. (I) SYSTEMATIC MYCOLOGY (1949-50).—A continuation of Course 64. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 F.; 3:00-4:50 M. F.

Mr. BANFIELD.

66. (II) INDUSTRIAL MYCOLOGY (1949-50).—Identification of the common yeasts and molds used in the manufacture of industrial products. Study and laboratory exercises in the processes involved. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 Th.; 3:00-4:50 M. F.

Mr. BANFIELD.

67. (I) 68. (II) INTRODUCTORY PLANT PHYSIOLOGY.—A study of the processes occurring in plants and their relation

to the complex of activities constituting plant growth. Topics include colloidal systems, osmotic phenomena, absorption, transpiration, and internal water relations of plants, photosynthesis, fat and protein synthesis, digestion, translocation, respiration, and growth. This is a basic course for students planning for advanced work in any branch of plant science.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

1:00-1:50 W.; 3:00-4:50 M.; 2:00-3:50 W.

Mr. KOZLOWSKI.

Prerequisites, Botany 25, Chemistry 29.

75. (I) METHODS IN PLANT PATHOLOGY (1950-51).—A course in the general techniques and specialized methods used in the investigation of plant diseases, including isolation, culture and pathogenicity studies of representative plant pathogenes, the preparation and sterilization of various culture media, elementary staining and histological techniques, the use of the microscope, study of fungicides, and training in elementary photographic procedures. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

2:00-2:50; 10:00-11:50 T.; 3:00-4:50 F. Mr. BANFIELD.

Prerequisite, Botany 51.

76. (II) PROBLEMS IN PLANT PATHOLOGY (1948-49).—Given in alternate years.

3 2-hour laboratory periods.

Hours by arrangement.

Credit, 3.

Mr. BANFIELD.

Prerequisite, Botany 51.

77. (I) 78. (II) PLANT PHYSIOLOGY (1949-50).—Advanced study in physiology. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Hours by arrangement. Mr. KOZLOWSKI.

Prerequisites, Botany 67, 68; Chemistry 51, 52.

81. (I) PLANT ECOLOGY.—A survey of the general relationship of plants to their environment, including a study of the individual factors (autecology) and of plant communities (synecology). Special emphasis is placed on the structure and succession of plant communities in New England.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. HODGE.

Prerequisite, Botany 1; Botany 26 recommended.

84. (II) THE FERNS (1949-50).—Intensive study of the morphology, life-history, and taxonomy of the fern plants, with especial attention to the fern flora of New England. Given in alternate years.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

1:00-1:50 Th.; 1:00-2:50 Tu.

Mr. OSMUN.

Prerequisite, Botany 25.

BUSINESS ADMINISTRATION

Professor GAMBLE, Professor HARDY, Associate Professor KIMBALL, Assistant Professor COLWELL, Assistant Professor DONALD, Assistant Professor HOAR, Assistant Professor SMART, Mr. GRIFFIN, Mr. LOPATA, Mr. NEEDHAM, Mr. RIVERS.

Accounting

25. (I) PRINCIPLES OF BUSINESS ACCOUNTING.—This course aims to give the student a working knowledge of the principles underlying the accounting system in the gathering, analysis, and interpretation of accounting data. The managerial uses of accounting as a means of business control are the keystone of the course.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
2:00-2:50 or 3:00-3:50 W.; 1:00-2:50 or 3:00-4:50 M. F.

Mr. COLWELL, Mr. SMART, Mr. GRIFFIN.

26. (II) PRINCIPLES OF BUSINESS ACCOUNTING.—This course covers the problems of partnership and corporation accounting. Considerable time is spent on problems in amortization, depreciation, and the preparation, analysis and interpretation of financial statements.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
2:00-2:50 W.; 1:00-2:50 M. F.

Mr. COLWELL, Mr. SMART, Mr. GRIFFIN.

71. (I) ADVANCED ACCOUNTING.—A fuller treatment of the accounting and financial problems of business units, including illustrative problems and case material.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. SMART.

Prerequisite, Accounting 26.

72. (II) ADVANCED ACCOUNTING.—A continuation of Accounting 71.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. SMART.

Prerequisite, Accounting 71.

73. (I) COST ACCOUNTING.—The application of accounting techniques to industrial costs.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. COLWELL, Mr. GRIFFIN.

Prerequisite, Accounting 26.

74. (II) ACCOUNTING SYSTEMS.—The application of accounting principles to representative types of business and the study of Federal Income Tax and Social Security accounting problems.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Accounting 73 .

Mr. COLWELL.

76. (II) AUDITING.—A course in the interpretation of accounting records dealing with theory and procedure. C.P.A. and American Institute of Accountants examination problems are studied.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Accounting 72 and 73. Mr. COLWELL.

Business Law

70. (II) BUSINESS LAW.—This course consists of a study of the drawing, reading, and interpretation of contracts and sales, with specific problem work. In addition, wills, commercial paper, carriers, real estate agency, public and personal rights are studied.

3 class hours. Credit, 3.

9:00-9:50 M. F. Mr. SMART, Mr. NEEDHAM.

71. (I) LEGAL ASPECTS OF ECONOMIC TRANSACTIONS.—A continuation of Course 70.

3 class hours. Credit, 3.

Mr. SMART.

Prerequisite, Business Law 70.

Industrial Administration

83. (I) BUSINESS MANAGEMENT.—A study of the problems connected with the management of a business enterprise.

3 class hours. Credit, 3.

Mr. GAMBLE, Mr. HOAR.

84. PERSONNEL ADMINISTRATION.—A study of the principles of the management of labor relations.

3 class hours. Credit, 3.

Mr. HOAR.

Marketing

52. (II) INDUSTRIAL PURCHASING.—A study of the purchasing problems of industrial enterprises and their market contacts with their sources of supply.

3 class hours. Credit, 3.

THE DEPARTMENT.

53. (I) MARKETING AND MARKETING PROBLEMS.—Not open to students who have taken or are taking Agricultural Economics 55. A study of the forces and conditions which determine prices and the mechanism, methods, and problems concerned with transporting, storing and distributing economic goods.

3 class hours. Credit, 3.

10:00-10:50 Tu. S.; 11:00-11:50 Th.

Mr. HARDY, Mr. LOPATA.

54. (II) **SALESMANSHIP AND SALES MANAGEMENT.**—The principles and practices of selling and the management of selling enterprises.

3 class hours.

Credit, 3.

Mr. HARDY.

71. (I) **RETAIL MERCHANDISING.**—A study of the operation and productive functions of retail business.

3 class hours.

Credit, 3.

Mr. HARDY, Mr. LOPATA.

72. (II) **MARKET RESEARCH.**—The aims, sources and fact-gathering methods of market research activities. General study and individual research projects.

3 class hours.

Credit, 3.

Mr. HARDY.

73. (I) **ADVERTISING.**—A study of the techniques and media of advertising, its services to business and the organization and economic function of the advertising industry.

3 class hours.

Credit, 3.

Mr. HARDY.

74. (II) **NEW ENGLAND MARKETS.**—Individual and group study of the marketing problems of New England industrial and marketing enterprises.

3 class hours.

Credit, 3.

THE DEPARTMENT.

CHEMISTRY AND CHEMICAL ENGINEERING

CHEMISTRY

Professor RITCHIE, Professor FESSENDEN, Professor SMITH, Associate Professor CANNON, Assistant Professor RICHASON, Assistant Professor ROBERTS, Dr. PARROTT*, Mr. CRUICKSHANK, Mr. OBERLANDER, Mr. POLCHLOPEK, Mr. WINER.

1. (I) 2. (II) **GENERAL CHEMISTRY.**—A study of the fundamental chemical laws and theories. A considerable amount of descriptive material will be included in connection with discussions of the periodic system, atomic structure, and in various applications of the principles. The object of the course is to give the student a sound scientific training through a course in chemistry. Students who have had no previous work in chemistry will be grouped together in laboratory and recitation sections so that they may have special attention. Offered for four credits at the University of Massachusetts at Fort Devens.

2 class hours; 1 quiz hour; 1 3-hour laboratory period.

Credit, 3.

1:00-1:50 M. F. or Tu. Th.; 3:00-3:50 M. Tu. Th. or F.; 2:00-4:50 M. Tu. Th. or F. Mr. FESSENDEN, Mr. RICHASON.

* On leave of absence for military service.

29. (I) and (II) **QUALITATIVE ANALYSIS.**—A study of the fundamental principles and laws concerning the behavior of solutions of electrolytes. The laboratory work deals with the characteristic properties, reactions, and the systemic separation and identification of the common cations and anions. The semi-micro technique is used throughout for the analysis of salts, salt mixtures, and alloys. A considerable portion of the laboratory work is devoted to the identification of substances unknown to the student. This course is designed to meet the needs not only of those students specializing in chemistry, but also of those students specializing in other subjects where inorganic chemistry is of importance.

2 class hours; 6 laboratory hours. Credit, 4.
8:00-8:50 or 11:00-11:50 Tu. Th.; 8:00-9:50 or 10:00-11:50
M. W. F. or 1:00-3:50 M. F. or 1:00-3:50 Tu. Th.

Mr. SMITH.

Prerequisite Chemistry 2.

30. (I) and (II) **QUANTITATIVE ANALYSIS.**—The theory and practice of representative determinations, both gravimetric and volumetric. The laboratory work will include the gravimetric analysis of chloride, sulfate, and limestone, volumetric work with acids and bases, volumetric precipitation methods, and oxidation reduction titrations.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
11:00-11:50 Tu. Th.; 1:00-3:50 M. F. or Tu. Th. or 1:00-3:50
W.; 9:00-11:50 S.

Mr. ROBERTS.

Prerequisite Chemistry 29.

31. (I) 32. (II) **ORGANIC CHEMISTRY.**—A short course intended to satisfy the requirements in this field for all students who do not specialize in chemistry.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 2:00-3:50 Th.

Mr. RITCHIE.

Prerequisites, Chemistry 1 and 2.

51. (I) 52. (II) **ORGANIC CHEMISTRY.**—A course in the theory of organic chemistry intended to serve the needs of students who will specialize in chemistry, as well as those who may specialize in other fields where a more comprehensive course is desired than Chemistry 31 and 32. The first semester deals largely with compounds of the aliphatic series, while the benzene series is taken up in the second semester. Students electing this course should take both 51 and 52.

3 class hours; 1 3-hour laboratory period. Credit, 4.
9:00-9:50 M. W. F.; 1:00-3:50 M. W. or F.

Mr. RITCHIE, Mr. CANNON.

Prerequisites, Chemistry 29.

63. (I) **CHEMISTRY OF WATER, SEWAGE AND SEWAGE SLUDGE.**—Admission by permission of the instructor. The preparation of reagents and standard methods for the analysis

of water, sewage and sewage sludge. Lectures and discussions on the sanitary significance of analytical data.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 W.; 9:00-11:50 S.

Mr. _____

Prerequisite, Chemistry 30.

65. (I) 66. (II) **PHYSICAL CHEMISTRY.**—A study of the fundamental theories and laws of physical chemistry, together with the solution of problems involved in their application. The laboratory work will include practice in making physico-chemical measurements and the preparation of reports.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

11:00-11:50 M. W. F.; 1:00-3:50 M. W. or F.

Mr. FESSENDEN, Mr. SMITH.

Prerequisites, Chemistry 30; Mathematics 30; Physics 26.

78. (II) **ADVANCED PHYSICAL CHEMISTRY.**—A detailed study of a number of topics such as kinetics, catalysis, chemical thermodynamics and electrochemistry.

3 class hours.

Credit, 3.

Mr. FESSENDEN.

Prerequisites, Chemistry 65 and 66.

79. (I) **BIOCHEMISTRY.**—An introduction to general biochemistry and physiological chemistry, with particular emphasis on the extension of fundamental organic chemistry to materials and processes of biological significance; proteins, lipids, carbohydrates, enzymes, etc. For students who expect to take up work in microbiology, botany, agronomy, nutrition, zoology, etc.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. _____.

Prerequisite, Organic Chemistry.

80. (II) **CLINICAL CHEMISTRY (Blood and Urine Analysis).**—Work to be covered will include the collection and preparation of samples for analysis; standardization of glassware and the preparation of reagents; description of colorimeters and the determination of certain significant compounds in the samples. The latter group will include at least sugars, proteins, non-protein, nitrogen, fatty substances and inorganic elements.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. RITCHIE.

81. (I) **ORGANIC CHEMISTRY.**—A rapid and intensive survey of the important reactions of organic chemistry with emphasis on their scope and limitations, recent developments and theoretical aspects.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. CANNON.

82. (II) QUALITATIVE ORGANIC CHEMISTRY.—The characterization of organic compounds by means of physical properties, class reactions, and the preparation of suitable derivatives. The laboratory work will involve the identification of a number of simple unknown compounds followed by the separation, purification, and identification of the individual components in several unknown mixtures of organic compounds.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
1:00-1:50 Tu. Th.; 2:00-4:50 Tu. Th. Mr. CANNON.

83. (I) ADVANCED QUANTITATIVE ANALYSIS.—Designed primarily for chemistry majors, but open to others with permission of the instructor. The laboratory work will include representative determinations in electrolytic and electrometric methods; and an introduction to colorimetry and other optical methods of analysis. Selected topics in the use of organic precipitants, silicate analysis, analysis of steel and other alloys, fuels, oils, water, and gases will also be included.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. ROBERTS.

Prerequisite, Chemistry 30.

85. (I) THEORETICAL INORGANIC CHEMISTRY.—A survey of inorganic chemistry which is largely theoretical and includes such topics as atomic structure, periodic classification and relationships, valence concepts, acid-base theory, and the chemistry of the commercially important elements and their compounds based upon the periodic table.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. SMITH.

Prerequisite, Chemistry 65.

88. (II) HISTORY OF CHEMISTRY.—An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and an appreciation of the true spirit of scientific research, through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of today.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. RITCHIE.

92. (II) INTRODUCTION RESEARCH.—Admission only by permission of the department. The aim of the course is to give the student an opportunity to learn the purpose and methods of research. To each student is assigned some special subject or problem in one of the following fields of chemistry, viz., analytical, biochemical, inorganic, organic, physical.

10 laboratory hours. Credit, 5.
Hours by arrangement. THE DEPARTMENT.

CHEMICAL ENGINEERING

Assistant Professor CASHIN, Mr. STENGARD.

55. (I) CALCULATIONS.—A problem course covering advanced stoichiometry, material balances, gas laws, vapor pressure, humidity, and fluid flow. Problems are of the industrial type.

3 class hours.

Credit, 3.

Mr. CASHIN.

Prerequisites, Chemistry 29, 30; Mathematics 31, 32; Physics 25, 26.

56. (II) UNIT OPERATIONS I.—A study of the fundamental principles underlying the unit operations of heat transfer, evaporation-diffusion processes, humidity, air conditioning, drying, and distillation. Solution of problems on the basis of actual operating data and descriptions of industrial process equipment are emphasized.

3 class hours.

Credit, 3.

Mr. STENGARD.

Prerequisites, Chemistry 65; Chemical Engineering 55.

57. (I) INORGANIC (INDUSTRIAL) TECHNOLOGY.—A study of the manufacture of some of the important inorganic chemicals. Topics studied include sulfuric acid, nitric acid, hydrochloric acid, ammonia, sodium carbonate, and sodium hydroxide with particular stress on the unit operations. Field trips will be included where possible.

3 class hours.

Credit, 3.

Mr. STENGARD.

Prerequisites, Chemistry 30; Physics 26.

58. (II) ORGANIC (INDUSTRIAL) TECHNOLOGY.—A study of some of the unit processes involved in the manufacture of organic materials. Unit processes studied include nitration, amination, halogenation, oxidation, and esterification. Field trips will be included where possible.

3 class hours.

Credit, 3.

Mr. STENGARD.

Prerequisite, Chemistry 51.

60. (II) HEAT-ENERGY RELATIONS.—A study of the laws of energy as applied to chemical engineering. A problem course covering internal energy, enthalpy, entropy, and free energy of matter. Applications to compression, refrigeration, real gases, and chemical equilibrium are studied.

3 class hours.

Credit, 3.

Mr. CASHIN.

Prerequisites, Chemistry 65; Chemical Engineering 55.

75. (I) INSTRUMENTATION.—A detailed study of the underlying principles and practices of indicating, recording,

and controlling instruments actually used on industrial chemical process equipment.

3 class hours.

Credit, 2.
Mr. CASHIN.

Prerequisites, Physics 25, 26; Chemical Engineering 56.

76. (II) ABSTRACTS.—Individual reports, both oral and written, on subjects of interest taken from current chemical and chemical engineering literature.

2 class hours.

Credit, 2.
THE DEPARTMENT.

Prerequisite, Chemical Engineering 93.

89. (I) CHEMICAL ENGINEERING LABORATORY I.—A quantitative study of pilot plant sized chemical engineering equipment, illustrating the unit operations of fluid flow, heat transfer, distillation, etc. Special emphasis is placed on the securing of reliable data, correct operating techniques, and the importance of industrial report writing.

1 3-hour period.

Credit, 2.
THE DEPARTMENT.

Prerequisite, Chemical Engineering 56.

90. (II) CHEMICAL ENGINEERING LABORATORY.—A continuation of Course 89, including the study of continuous rectification, gas absorption, heat transfer, drying and filtration.

2 4-hour laboratory periods.

Credit, 4.
THE DEPARTMENT.

Prerequisites, Chemical Engineering 89, 93.

93. (I) COMPREHENSIVE PROBLEMS (PROJECTS).—The solution of comprehensive problems which involve the application and integration of a number of the principles studied in previous courses in chemistry and chemical engineering. Particular emphasis is placed on the presentation of the results as formal reports.

2 class hours; 1 3-hour period.

Credit, 3.
Mr. CASHIN.

Prerequisites, Chemical Engineering 56, 60.

94. (II) COMPREHENSIVE PROBLEMS (PROJECTS) II.—The solution of problems similar to those in Course 93 will be undertaken, but in addition, will involve the application of principles studied in Course 97.

2 class hours; 2 3-hour periods.

Credit, 4.
THE DEPARTMENT.

Prerequisites, Chemical Engineering 93, 97.

97. (I) UNIT OPERATIONS II.—A continuation of Course 56, including the additional unit operations of gas absorption, absorption, solvent extraction, crystallization, filtration,

mixing, crushing and grinding, mechanical separation, and high pressure technique.

3 class hours.

Credit, 3.

Mr. STENGARD.

Prerequisite, Chemical Engineering 56.

98. (II) ADVANCED UNIT OPERATIONS.—A continuation of Course 97 with particular reference to diffusion processes and multi-component distillation.

2 class hours.

Credit, 2.

Mr. STENGARD.

Prerequisite, Chemical Engineering 97.

DAIRY INDUSTRY

Professor HANKINSON, Assistant Professor LINDQUIST,
Assistant Professor NELSON, Mr. FINNEGAN.

25. (I) GENERAL DAIRYING.—A general course, introductory to all other courses in dairy industry, for those who wish to take only one course in dairying to get a general knowledge of the subject. The work covers briefly: a study of milk, its secretion, composition, and various tests applied thereto; producing quality milk; methods of pasteurizing and handling milk and cream; the use of separators; elements of ice cream, butter, and cheese making.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

2:00-2:50 Tu. Th.; 9:00-10:50 W. or 3:00-4:50 Tu. or Th.

Mr. HANKINSON, Mr. FINNEGAN.

50. (II) JUDGING DAIRY PRODUCTS.—A study of market standards and grades of dairy products, with practice in judging milk, ice cream, butter, and cheese. The student learns to recognize quality in dairy products, to detect specific defects, and to know their causes and means of prevention. A team is chosen from this class to represent the University in two contests: Eastern States Intercollegiate Dairy Products Judging Contest, and Collegiate Students' International Contest in Judging Dairy Products.

1 2-hour laboratory period.

Credit, 1.

3:00-4:50 F.

Mr. NELSON.

52. (II) MARKET MILK.—A study of the various phases of the market milk industry; sanitary production, transportation, pasteurization and handling in the city plant; marketing, delivery systems, milk and its relation to public health, inspection, milk laws, food value, and advertising. Cultured milk and other milk drinks also are included. Some milk plants are visited, the cost of the trip not exceeding five dollars.

2 class hours; 2 2-hour laboratory periods.

Credit, 4.

11:00-11:50 Tu. Th.; 8:00-9:50 Tu. Th.

Mr. LINDQUIST.

75. (I) DAIRY CHEMISTRY.—This course is a particular study of those physical and chemical principles which not only explain the behavior of milk and milk products in the various technological operations, but also provide a basic viewpoint for dairy research. The lectures will include discussions (1) of the constituents of milk in relation to other organic compounds, and (2) the physicochemical aspects of certain dairy phenomena such as foaming, coagulation, etc. The laboratory work will include many of the tests used commercially and in dairy research, emphasizing the principles and application of both qualitative and quantitative analysis as well as the technique of operating scientific apparatus.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

8:00-10:50 Tu.; 8:00-9:50 Th. Mr. NELSON.

Prerequisites, Dairy 25, Dairy 52, and Chemistry 52, or permission of the instructor.

77. (I) BUTTER AND CHEESE MAKING.—Half of the semester is devoted to butter making; the remainder to cheese making, condensed and powdered milk. The various phases of the butter industry studied are: separators and cream separation; pasteurization, neutralization, and ripening of cream; preparation of starter cultures; churning; marketing and scoring of butter; creamery management. The work in cheese making includes Cheddar, cream Neufchatel, cottage, processed cheeses, etc. The manufacture of condensed and powdered milk, and commercial casein is also covered.

2 class hours; 2 3-hour laboratory periods. Credit, 4.

11:00-11:50 W. F.; 1:00-3:50 M. F.

Mr. LINDQUIST, Mr. NELSON, Mr. FINNEGAN.

Prerequisite, Dairy 25.

78. (II) ICE CREAM MAKING.—The course includes a study of the principles and practices of ice-cream making. The effects of such factors as composition, quality, pasteurization, homogenization, aging, and freezing on the finished product are considered. Sherbets, ices, fancy and individual forms, and all flavors of ice cream are studied. Some time is devoted to refrigeration, machinery, delivery equipment, and merchandising methods as they are related to the industry.

2 class hours; 2 3-hour laboratory periods. Credit, 4.

11:00-11:50 W. F.; 1:00-3:50 Tu. Th. Mr. NELSON.

79. (I) 80. (II) SEMINAR.—For students specializing in dairy industry.

1 class hour.

Credit, 1.

11:00-11:50 M.

THE DEPARTMENT.

ECONOMICS

Professor GAMBLE, Associate Professor KRAVIS, Associate Professor MORRIS, Assistant Professor SMART, Assistant Professor HALLER, Assistant Professor FERWERDA, Assistant Professor COLWELL, Assistant Professor HOAR, Mr. GERHARDT, Mr. GOODWIN, Mr. FARBER, Mr. PINES.

11. (I) ECONOMIC GEOGRAPHY.—A study of the geographic distribution of natural and human resources and the economic and physiographic bases of agriculture, manufacturing, and allied industries.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. HOAR.

12. (II) ECONOMIC HISTORY OF THE UNITED STATES.—A study of the significant factors in the economic development of the nation.

3 class hours.

Credit, 3.

Mr. HALLER.

25. (I) and (II) ELEMENTS OF ECONOMICS.—Definitions and introductory principles of production, exchange, and the financial organization of society, with a short survey of the economics of distribution and the use of wealth and income.

3 class hours.

Credit, 3.

Mr. GAMBLE AND THE DEPARTMENT.

26. (II) ELEMENTS OF DISTRIBUTION.—A continuation of Course 25 with emphasis on the study of wealth and income distribution.

3 class hours.

Credit, 3.

Prerequisite, Economics 25.

Mr. GAMBLE AND THE DEPARTMENT.

51. (I) ECONOMICS OF BUSINESS AND INDUSTRY.—A study of the industrial relationships and the principles upon which the production of economic goods is based, with particular emphasis upon administrative controls of cost, quality, quantity, standards, personnel and purchasing.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. COLWELL.

53. (I) MONEY, BANKING, AND CREDIT.—A critical survey of the development and operation of the monetary and banking systems of the United States.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. GAMBLE, Mr. KIMBALL, Mr. KRAVIS, Mr. PINES.

55. (I) ECONOMICS OF CONSUMPTION.—A study of patterns of consumption, standards of living and the sources and expenditure of individual and family incomes.

3 class hours.

Credit, 3.

Mr. HALLER.

56. (II) BUSINESS CYCLES.—A study of business fluctuations and an analysis of current business cycle theories.
3 class hours. Credit, 3.

Mr. KIMBALL, Mr. DONALD, Mr. PINES.

57. (I) CORPORATE FINANCE.—An introductory course in business finance concerned with forms of ownership organization, the nature and uses of corporate securities, provision and maintenance of capital, financial expansion, and corporate reorganization.
3 class hours. Credit, 3.

Mr. KIMBALL.

70. (II) MONOPOLIES (1948-49).—A study of the growth, development, and social control of monopolies. Given in alternate years.
3 class hours. Credit, 3.

Mr. HALLER.

73. (I) MODERN ECONOMIC THEORY.—A study of current theories about value, distribution and prices.
3 class hours. Credit, 3.

Mr. KRAVIS, Mr. MORRIS, Mr. PINES.

74. (II) CURRENT ECONOMIC PROBLEMS.—An advanced course for those desirous of studying more intensively some current economic problems. Students will be encouraged to pursue lines of individual interest.
3 class hours. Credit, 3.

Mr. GERHARDT.

76. (II) PRINCIPLES OF TRANSPORTATION.—The development of highway, waterway, and railway transportation, and its relation to the agricultural and industrial development of the country; the principles governing the operation and control of transportation agencies; present-day problems relating to the shipment of farm and industrial products, rates, facilities, and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation.
3 class hours. Credit, 3.

9:00-9:50 M. W. F.

Mr. RIVERS.

77. (I) ECONOMICS OF INTERNATIONAL TRADE (1949-50). A study of the policies, principles, and practices of international trade. Given in alternate years.
3 class hours. Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. KRAVIS.

78. (II) PUBLIC FINANCE.—Principles of public revenues and expenditures with special emphasis on the systems and problems of taxation.
3 class hours. Credit, 3.

11:00-11:50 M. W. F.

Mr. GAMBLE.

79. (I) **LABOR PROBLEMS.**—An analysis of the background and character of the modern labor problem with special references to the United States. Topics to be considered include: the problems of wages, hours, working conditions and unemployment; the trade union movement; and some agencies for the promotion of industrial peace.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. MORRIS, Mr. DONALD, Mr. HOAR, Mr. GERHARDT,
Mr. RIVERS.

80. (II) **LABOR LEGISLATION.**—A study of federal and state legislation affecting labor.

3 class hours.

Credit, 3.

Mr. MORRIS, Mr. HOAR.

81. (I) **PROBLEMS IN BUSINESS FINANCE.**—A Study of problems of financial management of business corporations and the effects of financial policies on the individual firm and the economy as a whole.

3 class hours.

Credit, 3.

Mr. KIMBALL.

Prerequisite, Economics 57.

82. (II) **INVESTMENTS.**—The principles and techniques that are useful for the analysis and selection of investment media; investment policies of individuals and institutions.

3 class hours.

Credit, 3.

Mr. KIMBALL.

Prerequisite, Economics 57 or consent of instructor.

91. (I) 92. (II) **SEMINAR.**—Research in economic theory; problems of labor, commerce, and industry. If desirable, some other economic study may be substituted.

1 or 2 2-hour conferences.

Credit, 1 to 3.

THE DEPARTMENT.

Government

25. (I) **AMERICAN GOVERNMENT.**—A study of the structure and operation of our federal government. The course is based on a study of the Constitution with reference to its historical development and interpretation. Special consideration is given to changes of the twentieth century and to present-day problems.

3 class hours.

Credit, 3.

THE DEPARTMENT.

28. (II) **STATE AND LOCAL GOVERNMENT.**—A survey of the governmental structure and functions of the American state and its local governments, with emphasis on state-local relationships.

3 class hours.

Credit, 3.

THE DEPARTMENT.

52. (II) EUROPEAN GOVERNMENTS.—Forms and methods of the governments of Europe: historic types and theories of government, progress and problems of democracy; dictatorships and totalitarian governments. Special study of the governments of England, France, Switzerland, Italy, Germany, and Russia.

3 class hours.

Credit, 3.

Mr. FERWERDA.

61. (I) PUBLIC ADMINISTRATION.—A general survey of the field of public administration. Special emphasis will be placed on the principles of organization, the functions performed by administration, and the relation of administration to democracy.

3 class hours.

Credit, 3.

Mr. GOODWIN.

62. (II) ADMINISTRATIVE LAW.—A study of government regulatory activities in relation to industry, agriculture, and labor, with emphasis on the legal framework within which these activities operate.

3 class hours.

Credit, 3.

Mr. GOODWIN.

63. (I) POLITICAL PARTIES AND ELECTIONS.—A study of the political process, and the nature and history of parties, pressure groups, nominations and elections.

3 class hours.

Credit, 3.

Mr. FARBER.

64. MUNICIPAL GOVERNMENT.—A survey of the governmental structure and function of American municipalities. Special attention is given to administrative problems arising from such functions as protection, education, welfare, correction, city planning and zoning.

3 class hours.

Credit, 3.

Mr. GOODWIN.

65. CONSTITUTIONAL LAW.—An historical study of the fundamental rights and guarantees under the American Constitution as interpreted by decisions of the Supreme Court.

3 class hours.

Credit, 3.

Mr. GOODWIN.

66. (II) AMERICAN POLITICAL THOUGHT.—A study of the development of American political thought from colonial times to the present, with emphasis upon writings of the period.

3 class hours.

Credit, 3.

Mr. FARBER.

67. (I) INTERNATIONAL GOVERNMENT.—A study of international organization in the twentieth century, with emphasis

upon the League of Nations, the World Court, and the United Nations and its affiliated agencies.

3 class hours.

Credit, 3.

Mr. FERWERDA.

68. (II) INTERNATIONAL LAW.—A study of the origin, character, and function of international law.

3 class hours.

Credit, 3.

Mr. FERWERDA.

93. (I) 94. (II) SEMINAR.—A study of special problems in the field of government. For seniors only.

3 class hours.

Credit, 3.

THE DEPARTMENT.

EDUCATION

Professor PURVIS, Assistant Professor OLIVER, Assistant Professor ROURKE, Assistant Professor McCARTHY, Mr. TAFT¹, Mr. DAYTON.

51. (I) HISTORY OF EDUCATION.—Educational movements are traced from early Greece to the present with the aim of better understanding of modern education. This is normally the beginning course for students undertaking work in Education.

3 class hours.

Credit, 3.

Mr. PURVIS.

52. (II) PRINCIPLES AND METHODS OF TEACHING.—By means of discussion, case studies, and current educational literature, teaching ideals and procedures are set up. Application of the general principles are made in the major fields represented by the class.

3 class hours.

Credit, 3.

Mr. McCARTHY.

53. (I) EDUCATIONAL TESTS AND MEASUREMENTS.—The most serviceable tests and scales for measuring achievement are considered; test construction, administration, scoring, and interpretation of results are studied and practiced. Considerable attention is given to preparation of informal tests for diagnostic and grading purposes.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. ROURKE.

61. (I) METHODS IN ADULT EDUCATION.—Admission only by permission of instructor. The beginning Education course for juniors and seniors who are training for extension work

¹ State Supervisor for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational agricultural acts.

and for others interested in teaching adults. Generally accepted methods of group and individual instruction with adults, and methods of developing leaders to carry on the work in the field.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. _____.

66. (II) PREPARATION AND USE OF AUDIO-VISUAL AIDS.—Study is made of available media of audio-visual aids to instruction, construction of visual material, and accepted methods of use.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. _____.

72. (II) VOCATIONAL EDUCATION IN AGRICULTURE.—The course demands certain prerequisites of experience and a definite objective on the part of the student to enter the field of vocational agricultural teaching which makes it necessary for the student to seek permission to enter the course. It is the first of the series of special courses (72, 73, 75) required of candidates for the vocational teacher-training certificate. A survey of vocational education and an introduction to teaching of vocational agriculture at the secondary school level is the basis of the course. Certain information and observations in preparation for the apprenticeship course are offered.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

73. (I) and (II) APPRENTICE TEACHING IN AGRICULTURE.—For a limited number of qualified candidates in vocational education. A full year in absentia normally following the junior year in college, teaching agriculture, horticulture, and related subjects. Candidates should have completed the course in Education 72, and in Education 52, if possible, and must apply early to the instructor of the course.

Maximum credit, 6.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

75. (I) TECHNIQUE OF TEACHING VOCATIONAL AGRICULTURE.—By arrangement with the instructor. Preferably this course should follow Courses 72 and 73. It covers the materials, methods, policies, and special requirements of Massachusetts for teaching agriculture and related subjects in high schools and special country schools. This is one of three courses required of candidates for the agricultural teacher-training certificates.

3 class hours.

Credit, 3.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

83. (I) **SECONDARY EDUCATION IN AMERICA.**—This course presents a picture of the secondary school as a social agency, its relation to elementary and collegiate education, its aims, organizations, administration, curriculum procedures, and such other phases as are necessary to acquaint the student with this predominant level of our educational ladder.

3 class hours.

Credit, 3.

Mr. McCARTHY.

85. (I) and (II) **OBSERVATION AND PRACTICE TEACHING.**—Admission by permission of the Department. An opportunity to do regular teaching in cooperating high schools within commuting distance of the University. The student works under the supervision of a teacher with frequent visits from some member of the staff.

Credit, 3.

THE DEPARTMENT.

Prerequisites, Education 51, 52, 83 or their equivalent.

88. (II) **THE SCHOOL CURRICULUM.**—This course discusses the curriculum of schools of this country from the point of view of the general social philosophy which created it. It seeks to make clear to the student the various controversial issues regarding such concepts as progressive education, the core-curriculum, the experience curriculum, projects, etc. An outline course of study is prepared by each student in the field he is to teach.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. ROURKE.

90. (I) and (II) **EVALUATION OF LEARNING.**—For senior majors in Education. Tests and scales for measuring ability and achievement; standard tests and interpretation of results; construction of informal tests for diagnostic and grading purposes.

3 2-hour periods the first and each alternate week. Credit, 3.

Mr. ROURKE.

91. (I) and (II) **SECONDARY SCHOOL CURRICULUM.**—For senior majors in Education. A consideration of learning material and activities and their organization in the subjects which these students are teaching, and the preparation of courses of study in those fields in the light of accepted educational practice.

3 2-hour periods the first and each alternate week. Credit, 3.

Mr. ROURKE.

Prerequisite, Education 51.

92. (I) and (II) **METHODS AND MANAGEMENT.**—For senior majors in Education. The basic methods underlying teaching and class management will be discussed and illustrated. The work in this course will be correlated as closely as possible

with the observation and practice of the students in neighboring schools.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. PURVIS.

Prerequisite, Education 51.

93. (I) and (II) PRINCIPLES OF SECONDARY EDUCATION.—For senior majors in Education. Practical problems concerning the school as a social agency, its aims, characteristics of pupil population, program of study, guidance, extra curriculum, etc., from the point of view of situations met by teachers.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. MCCARTHY.

Prerequisite, Education 51.

94. (I) and (II) PRACTICE TEACHING.—For senior majors in Education. Five school days of observation and teaching each alternate week in neighboring secondary schools under supervision of competent teachers and members of the staff. The second and each alternate week.

Credit, 5.
THE DEPARTMENT.

Prerequisite, Education 51.

AGRICULTURAL ENGINEERING

Professor STAPLETON, Associate Professor MARKUSON,
Assistant Professor TAGUE, Assistant Professor PUSHEE,
Assistant Professor BECK, Assistant Professor PFLUG,
Mr. RINES.

51. (I) HOUSE PLANNING.—Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen, and lighting, heating, water supply, and sewage disposal will be studied, together with a brief history of the house materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing and to maintenance and overhead expense.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. MARKUSON.

71. (I) FARM POWER.—The study of internal combustion engines used in farm tractors and power units.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. PFLUG.

Prerequisites, Civil Engineering 52, Mechanical Engineering 65, 68.

72. (II) DRAINAGE AND IRRIGATION ENGINEERING.—This course is an abridgment of Agricultural Engineering 78 for students not majoring in Engineering who do not have the prerequisites for Course 78.

1 class hour; 1 2-hour laboratory period. Credit, 2.
Mr. PFLUG.

73. (I) FARM STRUCTURES.—A study of the strength and durability of building materials, construction systems and the mechanical principles underlying their use in farm-construction. In the drafting room studies will be made of some major farm building and complete working drawings finished in all essential details.

1 class hour; 3 2-hour laboratory periods. Credit, 4.

Mr. MARKUSON.

Prerequisites, Civil Engineering 34, 51; Mechanical Engineering 61.

74. (II) FARM STRUCTURES.—This course is an abridgment of Agricultural Engineering 73 for students not majoring in Engineering who do not have the prerequisites for Course 73.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. STAPLETON.

76. (II) AGRICULTURAL MACHINERY.—The study of design and operational problems of agricultural field machinery. 2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. STAPLETON.

Prerequisites, Civil Engineering 52, Mechanical Engineering 68, 83.

78. (II) DRAINAGE, RECLAMATION AND CONSERVATION.—The course covers the engineering phase of drainage and reclamation. The various systems are studied, complete layouts established in the field, and problems of flow and run-off given.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. PFLUG.

Prerequisites, Civil Engineering 25, 75 or 76; Agronomy 2.

80. (II) FOOD PROCESS ENGINEERING.—A study of food processing machinery and instrumentation.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. PFLUG.

83. (I) 84. (II) AGRICULTURAL ENGINEERING PROBLEMS.—Open only to seniors specializing in agricultural engineering. This course consists of individual problems chosen by the students under guidance of the department.

Hours by arrangement. Credit, 3.

THE DEPARTMENT.

85. (I) RURAL ELECTRIFICATION.—A course devoted to the utilization of electricity in agriculture.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. STAPLETON, Mr. RINES.

Prerequisites, Electrical Engineering 61, 62.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in agricultural engineering.

1 class hour. Credit, 1.

THE DEPARTMENT.

CIVIL ENGINEERING

Professor MARSTON, Professor WHITE, Associate Professor OSGOOD, Associate Professor HENDRICKSON, Assistant Professor ANDERSON, Mr. COFFEY, Mr. MARCUS, Mr. GROW.

25. (I) SURVEYING.—The theory of surveying, description of field and office methods and procedure are given in the classroom. Topics covered are the use of the tape, transit, level, plane table, determination of latitude, longitude, and azimuth, principles of more precise measurements, and the elements of geodesy. The field and office work covers measurements and the plotting necessary for producing finished maps of small areas.

3 class hours; 2 3-hour laboratory periods. Credit, 5.
Mr. ANDERSON.

Prerequisite, Mathematics 5.

26. (II) ROUTE SURVEYING.—The principles of location, curves and earthwork, and horizontal and vertical control nets for highways, railroads, pipe lines, and transmission lines are considered.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. HENDRICKSON.

Prerequisites, Civil Engineering 25 or 27.

27. (I) PLANE SURVEYING.—The basic principles of mensuration are discussed in class. Instruction and problems involving the use of the tape, transit and level are given in the field, and the preparation of a map of a small area is carried out in the drafting room. This course is not open to civil engineering students.

1 class hour; 1 3-hour laboratory period. Credit, 2.
Mr. ANDERSON.

Prerequisite, Mathematics 5 or 7.

28. (Summer) PROPERTY AND TOPOGRAPHIC SURVEYING.—This practice course consists of a transit and tape property survey in which reference to Registry of Deeds records is used, a plane table topographic survey of selected areas is made. Certain topics of advanced surveying such as triangulation and conformal coordinate systems are treated briefly as they relate to the topographic surveys.

3 44-hour weeks. Credit, 3.
Mr. HENDRICKSON, Mr. ANDERSON.

Prerequisite, Civil Engineering 25 or 27.

30. (Summer) ROUTE SURVEYING PRACTICE.—This practice course consists of a preliminary survey for a short highway location and of the preparation of maps and profile from the data recorded on the survey. The maps are to be used

in C.E. 55 in choosing the final location of the route and in estimating earthwork quantities and cost.

3 44-hour weeks.

Credit, 3.
Mr. OSGOOD.

Prerequisite, Civil Engineering 26.

34. (II) APPLIED MECHANICS (STATICS).—The following topics are considered: equilibrium of forces (colinear, concurrent, non-concurrent, and parallel in a plane and in space); friction; first and second moments; center of gravity. Both algebraic and graphical methods are covered.

3 class hours.

Credit, 3.
Mr. WHITE, Mr. MARCUS.

Prerequisites, Physics 26; Mathematics 31.

51. (I) STRENGTH OF MATERIALS.—The following topics are considered: simple stresses and strains; combined stresses; torsion; shear and bending moments in beams; stresses and deflections of beams; columns.

4 class hours.

Credit, 4.
Mr. WHITE, Mr. MARCUS, Mr. SOBALA.
Prerequisites, Civil Engineering 34; Mathematics 32.

52. (II) APPLIED MECHANICS (KINETICS).—The following topics are considered: kinematics; linear and angular motion of particles; motion of rigid bodies; work, energy, and power; impulse and momentum.

3 class hours.

Credit, 3.
Mr. WHITE, Mr. SOBALA, Mr. GROW.
Prerequisites, Civil Engineering 34; Mathematics 32.

53. (I) STRENGTH OF MATERIALS.—A shortened version of C.E. 51 for electrical and mechanical engineers in the industrial option.

3 class hours.

Credit, 3.
Mr. WHITE, Mr. COFFEY, Mr. MARCUS.
Prerequisites, Civil Engineering 34; Mathematics 32.

55. (I) HIGHWAY ENGINEERING.—The design features of highway construction and relative merits of various types of highway surfaces are discussed in class. Plans, profiles, cross sections, and specifications for a short section of highway are prepared.

2 class hours; 1 3-hour laboratory period.

Credit, 3.
Mr. HENDRICKSON.

56. (II) TRANSPORTATION ENGINEERING.—A study of the basic principles of highway, railroad, water and air transportation. Operational requirements, economics of location, administration and finance, design considerations, and maintenance.

3 class hours.

Credit, 3.
Mr. HENDRICKSON.

Prerequisite, Civil Engineering 55.

61. (I) TESTING OF MATERIALS.—A study of laboratory methods for the determination of the physical properties of engineering materials and their behavior under stress. Usual methods supplemented by study of true stress-true strain for plastic action, stress analysis through strain study by photo-elastic analysis and electric strain gages. Magnaflux and Zygló inspection, special hardness tests, X-ray examination and research problems included in the lecture material.

1 class hour; 1 3-hour laboratory period. Credit, 2.
Mr. WHITE, Mr. COFFEY.

70. (II) THEORY OF STRUCTURES.—This course treats with the analysis of statically determinate structures of wood and steel, with reference to particular structures, such as industrial and office buildings, highway and railway bridges. The use of influence lines in the study of movable loads is included.

3 class hours; 1 3-hour laboratory period. Credit, 4.
Mr. OSGOOD, Mr. GROW.

Prerequisite, Civil Engineering 51.

71. (I) STRUCTURAL DESIGN.—This course is an application of the theory of structures to engineering practice through the preparation of designs and drawings for structural frames, girders and trusses in steel and wood that together make up a complete building frame or bridge. Emphasis is placed upon the design of structural members and joints.

1 class hour; 2 3-hour laboratory periods. Credit, 3.
Mr. OSGOOD.

Prerequisite, Civil Engineering 70.

72. (II) ADVANCED STRUCTURAL THEORY.—The analysis and design of continuous beams and trusses, rigid frames, arches, and tall buildings are considered in this course. Statically indeterminate methods of finding stresses and deflections are used.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. OSGOOD.

Prerequisite, Civil Engineering 71.

73. (I) CONCRETE AND MASONRY.—A study of the general properties of plain and reinforced concrete is included in this course. Application is made to the design of beams, slabs, columns, walls and foundations for buildings; retaining walls, arches and bridges. Drawings are prepared for a reinforced concrete building. A study is made of the elements of masonry construction and the use of bricks, concrete units and bearing tile in building construction.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
Mr. OSGOOD.

Prerequisite, Civil Engineering 51.

75. (I) FLUID MECHANICS.—This course is an abridgment of Civil Engineering 76.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. MARSTON.

Prerequisite, Civil Engineering 52.

76. (I) and (II) FLUID MECHANICS.—The following topics are considered: properties of fluids, gas laws, viscosity, static pressure, gages, buoyant forces, dynamics of fluids, Bernoulli's theorem, flow in pipes, orifices, nozzles, weirs, and open channels. Hydraulic similitude is also discussed.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. MARSTON.

Prerequisite, Civil Engineering 52 concurrently.

77. (I) WATER SUPPLY.—This course considers the engineering aspects of public water supply systems and includes the following topics: quantity of water required; hydrology; collection systems; distribution systems; pumping machinery; purification work. The laboratory period is used for inspection trips and the treatment of special problems.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. ANDERSON.

Prerequisite, Civil Engineering 76 or 75 concurrently.

78. (II) SANITARY ENGINEERING (SEWERAGE).—This course considers the engineering aspects of the design, construction, and maintenance of sewerage systems and includes the following topics: hydraulics of sewers, sanitary and storm sewers, sewage treatment, plant design and operation.

3 class hours.

Credit, 3.

Mr. ANDERSON.

Prerequisite, Civil Engineering 77.

79. (I) WATER SUPPLY (1949-50).—This course is an abridgment of Civil Engineering 77 for non-engineering students. Given in alternate years.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. ANDERSON.

80. (II) SOIL MECHANICS.—This course is a study of the mechanical classification of soils based upon field and laboratory work and the validity of these classifications as a means of predicting soil behavior. The student is guided through case studies in embankment stability, seepage, and consolidation.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. HENDRICKSON.

Prerequisite, Geology 50.

81. (I) FOUNDATIONS.—A survey of modern theories and practice in transferring structural loads to earth masses. Pile

foundations, spread footings, caissons, and buoyant systems are discussed.

2 class hours.

Credit, 2.

Mr. HENDRICKSON.

Prerequisite, Civil Engineering 80.

90. (II) CONTRACTS, SPECIFICATIONS AND ESTIMATING.—A study of the essentials of contracts as applied to business procedures in the construction field, the purposes and make-up of specifications, and the processes of estimating through quantity, surveys and unit cost applications.

3 class hours.

Credit, 3.

Mr. MARKUSON.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in civil engineering. Current engineering projects are described by student reports. The professional aspect of the civil engineer's work is stressed.

1 class hour.

Credit, 1.

THE DEPARTMENT.

94. (II) ADVANCED SURVEYING.—The following topics are included: elements of astronomy, precise methods of surveying, adjustment of observations and the elements of photogrammetry.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. HENDRICKSON.

Prerequisites, Civil Engineering 25, 28.

96. (II) HYDRAULIC ENGINEERING.—The analysis and design of hydraulic structures such as storage reservoirs, spillways, dams, levees, and shore protection and channel works are considered.

2 class hours. 1 3-hour laboratory period.

Credit, 3.

Mr. MARSTON.

Prerequisites, Civil Engineering 71, 73, 76.

ELECTRICAL ENGINEERING

Professor BROWN, Professor ROYS, Associate Professor WILSON, Associate Professor LANGFORD, Assistant Professor MOHN, Assistant Professor SMITH, Mr. SACHSE, Mr. CHANG, Mr. JATRAS, Mr. LEVINE

40. (II) FUNDAMENTALS OF ELECTRICAL ENGINEERING.—This course is a study of direct-current circuits, magnetism and electromagnetism, magnetic fields in air and iron, induced and generated voltages, inductance, capacitance, electric fields, conduction in liquids, and basic electrical measurements. The laboratory is devoted largely to electrical measurements, including instrument calibration and standardization, electrical instruments, fluxmeters, permeameters, simple bridges and

potentiometers and stresses analysis of methods and accuracies.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. JATRAS.

Prerequisites, Physics 26; Mathematics 31.

51. (I) ALTERNATING-CURRENT CIRCUITS.—This course is a study of alternating currents in power and communications, and includes instantaneous voltage and current relationships, vector representation, resonance phenomena, basic network theorems, coupled circuits, single phase and polyphase, circuits, power and power measurements, non-sinusoidal waves.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. JATRAS.

Prerequisite, Electrical Engineering 40.

53. (I) DIRECT-CURRENT MACHINERY.—This course is a study of direct-current generators and motors with respect to their characteristics, design, operation, applications, and control.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. SACHSE.

Prerequisite, Electrical Engineering 40.

54. (II) ALTERNATING-CURRENT MACHINERY.—This course is a study of alternating-current generators, motors, transformers, and converters with respect to their design, operation, control and applications.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. WILSON.

Prerequisites, Electrical Engineering 51, 53.

57. (I) ENGINEERING ANALYSIS.—This course is a study of differential equations as applied to electric systems, hyperbolic, Bessel, and Legendre functions, vector analysis and calculus with applications to electricity and magnetism, elliptic integrals, and solutions of field problems by conformal mapping.

3 class hours.

Credit, 3.
Mr. MOHN.

Prerequisites, Mathematics 32; Electrical Engineering 40.

61. (I) 62. (II) PRINCIPLES OF ELECTRICAL ENGINEERING.—This course is designed for mechanical, industrial, and agricultural engineering students, and is a study of d-c and a-c circuits, d-c and a-c machines, and basic electronics.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. LEVINE.

Prerequisites, Physics 26; Mathematics 32.

63. (I) **ELEMENTS OF ELECTRICAL ENGINEERING.**—This course is for civil engineering students and is a brief study of d-c and a-c circuits and machines.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SMITH.

Prerequisites, Physics 26; Mathematics 32.

65. (I) **INDUSTRIAL APPLICATIONS.**—This course is designed for mechanical and industrial engineering students and is a brief study of motor selection and control, protective devices, and electric and electronic applications in industry, their measurement and control.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SACHSE.

Prerequisite, Electrical Engineering 62.

74. (II) **ELECTRONICS.**—This course includes the study of electron motion in electric and magnetic fields, electron tubes and their characteristics, rectifiers, and Class A amplifiers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. MOHN.

Prerequisite, Electrical Engineering 51.

75. (I) **APPLIED ELECTRONICS.**—This is a continuation of Course 74 and includes a study of electron tubes and associated apparatus in power amplifiers, oscillators, amplitude and frequency modulation, detection, multivibrators, and vacuum tube instruments.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. LANGFORD.

Prerequisite, Electrical Engineering 74.

77. (I) **ELECTRIC NETWORK ANALYSIS.**—This course is a review of fundamental circuit principles and theorems, Fournier's Series and Integral and their applications to distorted waves and pulses, long lines and filters under steady state A-C conditions and traveling waves in transmission systems.

3 class hours.

Credit, 3.

Mr. BROWN.

Prerequisite, Electrical Engineering 51.

78. (II) **TRANSIT ANALYSIS.**—This course is a study of the transient behavior of electrical, mechanical and thermal systems, and includes the formulation of the ordinary and partial differential equations of dynamic systems and their solution by the classical and Heaviside methods and by Fournier and Laplace transforms.

3 class hours.

Credit, 3.

Mr. ROYS.

Prerequisites, Electrical Engineering 51, 57.

79. (I) **ELECTRICAL COMMUNICATIONS.**—This course is a study of the fundamentals of communication circuits, including circuit elements, basic network theorems, impedance transformations, equalizers, and bridge circuits.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. LANGFORD.

Prerequisite, Electrical Engineering 51.

80. (II) **ELECTRICAL COMMUNICATIONS.**—This is a continuation of Course 75 and includes a study of vacuum tube circuits used in communications, distortion, noise, class B and C power amplifiers, modulation and demodulation practice, oscillator design, transmitters and receivers, antennas and radiation, and electromechanical transducers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. LANGFORD.

Prerequisites, Electrical Engineering 75, 79.

81. (I) **ADVANCED ELECTRICAL MACHINERY.**—This is a continuation of Course 54 and is a more advanced study of a-c machines, including the general methods of machine analysis through the use of matrices, symmetrical components, equivalent circuits, and circle diagrams. Emphasis is placed on single-phase and variable-speed A-C motors, converters and inverters, selsyns and amplidynes, and multi-winding transformers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisite, Electrical Engineering 54.

82. (II) **POWER APPLICATIONS IN INDUSTRY.**—This course is a study of industrial applications of electrical machines, and includes power supplies to industrial plants, load requirements, types of drives, mechanical requirements of variable speed drives, torque relations in d-c and a-c motors, motor applications and control, and selsyn systems.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisite, Electrical Engineering 81.

84. (II) **INDUSTRIAL ELECTRONICS.**—This course is a study of special characteristics of the electron tubes of industry, the theory, design and operation of commercial types of circuits utilizing these tubes, including stroboscopes, grid-controlled and polyphase rectifiers, inverters, welding controllers, speed and voltage regulators, high frequency heating circuits, etc.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. ROYS.

Prerequisite, Electrical Engineering 74.

86. (II) **POWER SYSTEM NETWORKS.**—This course is a study of power system networks including power transfer

diagrams, voltage studies, system stability criteria, short-circuit calculations, and protective methods.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisites, Electrical Engineering 77, 81.

88. (II) COMMUNICATION NETWORKS.—This is a continuation of Course 77, consisting of Foster's Reactance Theorem, the matrices of transducers and the principles of network synthesis. Applications include the analysis and design of filters, equalizers and other frequency responsive networks under both steady state and transient conditions.

3 class hours.

Credit, 3.

Mr. ROYS.

Prerequisites, Electrical Engineering 77, 79.

90. (II) ILLUMINATION.—This course is an introduction to illumination engineering and includes a study of light sources, units, measurements, vision, and lighting calculations and design.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. BROWN.

Prerequisites, Physics 26; Mathematics 32.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in electrical engineering. Current engineering developments are discussed through student reports. The professional aspect of the electrical engineer's work is stressed.

1 2-hour period.

Credit, 1.

Mr. BROWN.

94. (II) ULTRA-HIGH-FREQUENCY TECHNIQUES. — This course is a study of u.h.f. oscillators, amplifiers, transmitters, receivers, transmission systems, antennas, multi-vibrators, trigger and gate circuits, electronic switches, and controls.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. MOHN.

Prerequisites, Electrical Engineering 75, 79.

96. (II) ELECTROMAGNETIC ENGINEERING.—This course is a study of the fundamentals of electromagnetic radiation, including Ampere's and Faraday's laws, Gauss's theorem, retarded potential and Hertz' vector, Maxwell's equations, and the Poynting vector. These are applied to wave propagation, reflection and refraction, lines, wave guides and cavity resonators, antennas, and ionosphere reflections.

3 class hours.

Credit, 3.

Mr. ROYS.

Prerequisites, Electrical Engineering 57, 77.

MECHANICAL ENGINEERING

Professor BATES, Professor SWENSON, Professor WEAVER, Associate Professor WOLOWICZ, Assistant Professor NEWLON, Assistant Professor KEYSER, Assistant Professor DITTFACH, Assistant Professor LONGSTAFF, Assistant Professor EMERSON, Mr. CARD, Mr. SOBALA.

1. (I) ENGINEERING DRAWING I.—The purpose of the course is to develop skill in the use of drafting equipment with a working knowledge of orthographic projections, lettering, auxiliary views, sectional views, tracings and pictorial representation of machine parts.

2 3-hour laboratory periods. Credit, 2.

Mr. SWENSON, Mr. LONGSTAFF, Mr. CARD.

2. (II) ENGINEERING DRAWING II.—This course is designed to develop further skill in the use of drafting equipment and give practice in the making of working drawings through the study of dimensioning, fastenings, conventional representations, detail and assembly drawings, and reading of working drawings. Graphs, and intersection and development problems will also be studied.

2 3-hour laboratory periods. Credit, 2.

Mr. SWENSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisite, Mechanical Engineering 1.

3. (I) DESCRIPTIVE GEOMETRY.—The course encompasses a study of the graphical methods applicable to engineering problems. Its content consists of the principles of orthographic projections, problems relating to lines and planes, graphic computations, polyhedrons, curved surfaces, warped surfaces and practical applications.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. SWENSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisite, Mechanical Engineering 2.

23. (I) SHOP.—The course is designed primarily for engineers other than mechanical. Approximately half the semester is spent in woodworking, pattern making, forging and welding; in the other half the student gains experience in the machine shop, where he becomes familiar with the various machine and hand tools used in metal working.

2 4-hour laboratory periods. Credit, 3.

Mr. NEWLON, Mr. PUSHEE, Mr. BECK.

27. (Summer) SHOP.—In the first part of the course woodworking and pattern making experience is gained on machines and with hand tools at the bench. The course next proceeds to the forging and heat treating of metals and then to the various methods of welding.

2 4-hour laboratory periods. Credit, 3.

Mr. PUSHEE, Mr. NEWLON, Mr. BECK.

28. (Summer) MACHINE SHOP.—Proficiency in metal working is obtained by lathe, drill press, planer, milling, grinding, screw machine and allied work, including hand tools at the bench. Some of the time is devoted to classroom work in the theory of machine tool operation, fits and tolerances.

2 4-hour laboratory periods.

Credit, 3.

Mr. NEWLON.

59. (I) and (II) MATERIALS OF CONSTRUCTION.—Properties of engineering materials; failure by (a) exceeding the elastic limit, (b) creep, (c) fatigue, and (d) corrosion. The crystalline nature of metals, structural metals, general methods of metal fabrication, wood, stone, clay products, cement and concrete, plastics, protective coatings, and water.

2 class hours.

Credit, 2.

Mr. KEYSER.

Prerequisites, Chemistry 1; Physics 26.

63. (I) ENGINEERING THERMODYNAMICS I.—This course is a treatment of the application of the laws of heat to various energy-transforming devices. Topics include ideal and actual cycles of steam, internal combustion engines, and air compressors together with problems pertaining to these machines, energy transformations in fluid flow, variable specific heats and mixtures of gases.

4 class hours.

Credit, 4.

Mr. SWENSON, Mr. WOLOWICZ, Mr. LONGSTAFF, Mr. DITTFACH.

Prerequisites, Physics 26; Mathematics 30 or 32.

64. (II) ENGINEERING THERMODYNAMICS II.—A continuation of the work of Course 63. Study will be made of liquids and vapors, thermodynamic cycles, energy transformations and the transfer of heat, together with engineering problems pertaining to these devices.

4 class hours.

Credit, 3.

Mr. SWENSON, Mr. WOLOWICZ, Mr. LONGSTAFF, Mr. DITTFACH.

Prerequisite, Mechanical Engineering 63.

65. (I) HEAT ENGINEERING I.—This course is a survey of the field of applied energy and is designed for engineering students outside of the mechanical engineering field. The application of the laws of heat to energy transforming devices is studied, but not as extensively as in Courses 63 and 64. A study will be made of gases, vapors, fuels, combustion, heat transfer, measurement of power, air compressors, fans, refrigeration and air conditioning.

3 class hours.

Credit, 3.

Mr. EMERSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisites, Physics 26; Mathematics 6.

66. (II) **HEAT ENGINEERING II.**—A continuation of the work of Course 65. Internal combustion engines and turbines, jet propulsion and power plants will be studied.

3 class hours.

Credit, 3.

Mr. EMERSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisite, Mechanical Engineering 65.

67. (I) **MECHANICAL INSTRUMENTATION LABORATORY.**—The calibration and application of instruments used in the testing of mechanical engineering apparatus.

1 3-hour laboratory period.

Credit, 1.

Mr. SWENSON, Mr. WOLOWICZ, Mr. DITTFACH, Mr. CARD.

Prerequisite, Mechanical Engineering 63 concurrently.

68. (II) **KINEMATICS.**—Principles of mechanism, including velocity and acceleration diagrams, instant centers, gear teeth and gear trains, cams, and various speed transmissions.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES, Mr. SOBALA.

Prerequisites, Mechanical Engineering 1; Civil Engineering 52.

72. (II) **FUNDAMENTALS OF METALLURGY.**—Physical metallurgy involving crystal structure, solid solutions, diffusion in the solid state, freezing of metals, hardening of metals, annealing, and equilibrium diagrams. These fundamentals are then applied to the study of the iron-iron carbide diagram, the S-curve, heat treatment of steel and the properties and uses of the other principal engineering metals. Laboratory work stresses metallographic and radiographic technique.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. KEYSER.

Prerequisite, Mechanical Engineering 59 or Chemistry 66.

75. (I) **STEAM POWER PLANTS.**—This course is a study of the steam power plant, including boilers, stokers, fuels, combustion, steam generation, prime movers, and auxiliary equipment, and engineering problems involved in design and operation.

3 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. SWENSON.

Prerequisite, Mechanical Engineering 64.

76. (II) **REFRIGERATION AND AIR CONDITIONING.**—The course content includes a study of the fundamental principles of thermodynamics as applied to refrigeration and air control. Application of refrigeration to industrial processes and the control of temperature, humidity and motion of air in buildings will be studied.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SWENSON.

Prerequisite, Mechanical Engineering 64.

77. (I) INTERNAL COMBUSTION ENGINES.—A study is made of spark-ignition and compression-ignition engines including design, fuels, carburetion, ignition, combustion, lubrication, cooling, and engine performance. The gas turbine and jet propulsion will be included.

3 class hours.

Credit, 3.

Mr. DITTFACH.

Prerequisite, Mechanical Engineering 64.

79. (I) MECHANICAL ENGINEERING LABORATORY I.—Tests of fuels and lubricants. Performance tests of steam engines and turbines, gasoline and Diesel engines, fans, hydraulic apparatus, refrigeration systems and other typical engineering equipment. Emphasis on laboratory procedure and orderly presentation of results.

2 3-hour laboratory periods.

Credit, 2.

Mr. SWENSON, Mr. WOLOWICZ, Mr. DITTFACH, Mr. CARD.

Prerequisites, Civil Engineering 76 or 75 concurrently; Mechanical Engineering 64 or 66; Mechanical Engineering 67 for Mechanical Engineering majors.

80. (II) MECHANICAL ENGINEERING LABORATORY II.—This course continues the work of the first semester in more advanced phases.

2 3-hour laboratory periods.

Credit, 2.

Mr. SWENSON, Mr. WOLOWICZ, Mr. DITTFACH, Mr. CARD.

Prerequisite, Mechanical Engineering 79.

82. (II) FLUID MACHINERY.—Application of the principles of fluid mechanics to the theory of impulse and reaction water wheels, centrifugal pumps and compressors, and axial-flow blowers. Consideration is also given to the design of high pressure reciprocating and rotary pumps, hydraulic transmissions, sequence valves, etc., and their use in hydraulic-circuits.

3 class hours.

Credit, 3.

Mr. WOLOWICZ.

Prerequisite, Civil Engineering 76.

83. (I) MACHINE DESIGN.—Principles involved in the design of various machine parts including fastenings, shafts, belts, bearings, gears, and pressure vessels.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES.

Prerequisites, Civil Engineering 52 and either 51 or 53; Mechanical Engineering 68.

85. (I) DYNAMICS OF MACHINERY.—Gyroscopic effects, governors, dynamic balancing of rotating machinery. Analysis of unbalanced forces in a machine containing parts moving with rotation, reciprocation, and their combination. Elements

of vibration theory, vibration isolation, vibration analysis of equivalent masses and shaft systems. Vibration absorbers. 3 class hours.

Credit, 3.

Mr. WOŁOWICZ.

Prerequisites, Civil Engineering 52; Mechanical Engineering 68.

86. (II) ADVANCED MACHINE DESIGN.—A continuation of Course 83. Additional elementary parts are studied which combine into the design of a complete machine in the latter part of the course.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES.

Prerequisite, Mechanical Engineering 83.

88. (II) STEADY FLOW MACHINERY.—The principles of thermodynamics are applied to steam and internal combustion turbines, condensers, and other heat transfer apparatus. 3 class hours.

Credit, 3.

Mr. SWENSON.

Prerequisites, Mechanical Engineering 64 or 66; Civil Engineering 76.

90. (II) ADVANCED METALLURGY.—Mechanical metallurgy covering the behavior of metals in the plastic state; the shaping of metals by mechanical means such as drawing, rolling, spinning, etc.; the primary methods of metal fabrication such as casting, welding, powder metallurgy, electroforming; the metallurgical applications of radiography.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. KEYSER.

Prerequisite, Mechanical Engineering 72.

91. (I) PROFESSIONAL SEMINAR.—For senior and graduate students only. Presentation of papers on various important subjects in the field of mechanical engineering, with principal emphasis on recent developments.

Credit, 1.

THE DEPARTMENT.

Industrial Engineering

25. (I) MANUFACTURING PROCESSES.—A study of the manufacturing processes in use in industry. The principles and methods applied. Demonstration through the use of field trips and motion pictures.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

Mr. WEAVER.

51. (I) INDUSTRIAL MANAGEMENT.—A course designed to acquaint the student with the principles of industrial engineering and their application to the solution of the problems of industrial plant operation.

3 class hours.

Credit, 3.

Mr. WEAVER.

75. (I) JOB EVALUATION.—A study of the principles used to determine an evaluation of all occupations in order to establish an equitable rating between them, to establish sound wage and salary policies.

3 class hours.

Credit, 2.

Mr. WEAVER.

Prerequisite, Industrial Engineering 51.

76. (II) TIME STUDY.—A study of the principles involved in the establishment of production standards and their application in the management functions of cost accounting, estimating, production control, incentives, budgetary control.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. WEAVER.

Prerequisites, Industrial Engineering 75, 82 concurrently except for Business Administration majors.

77. (I) PRODUCTION CONTROL.—A study of the principles used to regulate production activities in keeping with the manufacturing plan.

3 class hours.

Credit, 3.

Mr. EMERSON.

Prerequisite, Industrial Engineering 51.

78. (II) FACTORY PLANNING AND LAYOUT.—A study of the principles applying to the determination and development of the physical relationship between plant, equipment and operators working toward the highest degree of economy and effectiveness in operation.

1 class hour; 1 3-hour laboratory period.

Credit, 2.

Mr. SOBALA.

Prerequisites, Mechanical Engineering 2; Industrial Engineering 51.

80. (II) PLANT BUDGETARY CONTROL.—A study of the principles used to pre-determine expenses for the factors of production and the comparison of results with the estimates to determine and deal with the causes of expense variations as applied by the operating organization in the industrial plant.

3 class hours.

Credit, 3.

Mr. WEAVER.

Prerequisite, Industrial Engineering 51.

82. (II) WORK SIMPLIFICATION.—A study of the principles involved in the simplification of means of doing work and in the application and use of these principles.

1 class hour; 1 3-hour laboratory period.

Credit, 2.

Mr. WEAVER.

Prerequisites, Mechanical Engineering 68; Industrial Engineering 76 concurrently.

86. (II) **INDUSTRIAL ENGINEERING.**—A broad course dealing with the many problems encountered in a modern industry. Topics include types of organization, management, plant location, arrangement of equipment, product design, methods of production control, costs, wage payment systems and personnel relations.

3 class hours.

Credit, 3.
Mr. EMERSON.

92. (II) **PROFESSIONAL SEMINAR.**—For seniors and graduate students.

Credit, 1.
THE DEPARTMENT.

ENGLISH

Professor RAND, Professor PRINCE, Professor MUSGRAVE, Professor GOLDBERG, Associate Professor HELMING, Associate Professor TROY, Assistant Professor HORRIGAN, Assistant Professor DU BOIS, Assistant Professor VARLEY, Assistant Professor O'DONNELL, Mr. LANE, Mrs. WRIGHT, Mr. MARCUS, Miss TARANTINO, Mr. DIFFLEY.

1. (I) 2. (II) **ENGLISH COMPOSITION.**—Intended to teach straight thinking, sound structure, clear and correct expression.

3 class hours.

Credit, 3.
THE DEPARTMENT.

25. (I) 26. (II) **A SURVEY OF ENGLISH LITERATURE.**—A general reading course, from the beginning of English literature to the end of the Nineteenth Century. Scheduled hours include Speech 29. (I) 30. (II).

2 class hours.

Credit, 2.
THE DEPARTMENT.

50. (II) **CHAUCE (1949-50).**—Reading of the principal works of Chaucer; a study of Chaucer's development as a creative artist; an attempt to appreciate his humanism. Given in alternate years.

3 class hours.

Credit, 3.
Mr. PRINCE.

51. (I) **THE RENAISSANCE IN ENGLAND.**—A study of various aspects of the Renaissance as revealed in such writers as Spencer, Bacon, Sir Thomas Browne, Burton, and Hobbes. Special emphasis is given to Spencer's *Faerie Queene*.

3 class hours.

Credit, 3.
Mr. TROY.

52. (II) **LYRIC POETRY OF THE SEVENTEENTH CENTURY (1949-50).**—A study of the lyric poetry of Jonson, Herrick, Lovelace, Suckling, Donne, Herbert, Vaughan and others.

Special emphasis will be given to the development and influence of the Cavalier and Metaphysical schools. Given in alternate years.

3 class hours.

Credit, 3.

Miss HERRIGAN.

54. (II) MILTON (1948-49).—The development of the mind and art of Milton as Renaissance writer. Emphasis is placed upon *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*. Given in alternate years.

3 class hours.

Credit, 3.

Mr. GOLDBERG.

55. (I) SHAKESPEARE.—This course is based upon the reading of about thirty of Shakespeare's plays, and attempts both to indicate the evolution of the dramatist and to emphasize the various phases of his art.

3 class hours.

Credit, 3.

Mr. RAND.

56. (II) AMERICAN PROSE.—A course in American thought as revealed in Emerson, Thoreau, Hawthorne, Melville, Henry Adams, and Santayana.

3 class hours.

Credit, 3.

Mr. PRINCE, Mr. O'DONNELL.

57. (I) ELIZABETHAN DRAMATISTS.—A study of Elizabethan Drama, exclusive of Shakespeare, with special consideration of the plays of such men as Lyly, Peele, Green, Kyd, Marlowe.

3 class hours.

Credit, 3.

Mr. PRINCE.

58. (II) ELIZABETHAN DRAMATISTS (1948-49).—A continuation of English 57, with special consideration of the plays of Jonson, Beaumont, Fletcher, Webster, Ford, Massinger, Chapman, Middleton and Shirley. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PRINCE.

Prerequisite, English 57.

59. (I) ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY (1949-50).—A brief exposition of the thought and the literature of the period, as found especially in the work of DeFoe, Swift, Shaftesbury, Mandeville and Pope. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PRINCE.

60. (II) ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY (1949-50).—A continuation of English 59, but may be elected independently. A study of the literature of the later

Eighteenth Century with special emphasis on the Jonson Circle. Given in alternate years.

3 class hours.

Credit, 3.
Mr. TROY.

61. (I) ROMANTIC POETRY (1950-51).—A study chiefly in the beginning of Romanticism in English poetry as found in the work of Collins, Gray, Burns, and Blake, with considerable attention to the culmination of Romanticism in the poetry of Shelley and Keats. Given in alternate years.

3 class hours.

Credit, 3.
Mr. PRINCE.

62. (II) ROMANTIC POETRY (1948-49).—A contrasting study of Byron and the Lake Poets, and in some ways a continuation of English 61. Given in alternate years.

3 class hours.

Credit, 3.
Mr. RAND.

63. (I) AMERICAN POETRY (1949-50).—A study of American poetry from Colonial times to 1900, with especial emphasis upon the work of Freneau, Bryant, Emerson, Longfellow, Whittier, Poe, Whitman, and Emily Dickinson. Given in alternate years.

3 class hours.

Credit, 3.
Mr. DuBois.

64. (II) VICTORIAN POETRY (1949-50).—A study of Tennyson and Browning. Given in alternate years.

3 class hours.

Credit, 3.
Mr. RAND.

65. (I) ENGLISH PROSE OF THE NINETEENTH CENTURY.—A study of the chief Romantic prose writers in relation to literary techniques and main currents of epochal thought and feeling. Among the authors treated are Coleridge, Lamb, Hazlitt, DeQuincey, Carlyle, and Ruskin.

3 class hours.

Credit, 3.
Mr. GOLDBERG.

66. (II) ENGLISH PROSE OF THE NINETEENTH CENTURY.—A continuation of English 65, but may be elected independently. A study of the chief Victorian prose writers in relation to literary techniques and main currents of epochal thought and feeling. Among the authors treated are Macaulay, Newman, Arnold, Huxley, Pater, and Stevenson.

3 class hours.

Credit, 3.
Mr. GOLDBERG.

68. (II) MODERN DRAMA (1948-49).—This course traces the development of English drama from the time of Ibsen to the present day. Its purpose is to impart an intelligent and

sympathetic interest in the theatre of the twentieth century. Given in alternate years.

3 class hours.

Credit, 3.
Mr. RAND.

70. (II) ENGLISH PROSE FICTION.—A course designed to illustrate the development of English prose fiction, with emphasis upon the great novels of the eighteenth and nineteenth centuries.

3 class hours.

Credit, 3.
Mr. HELMING.

71. (I) BIOGRAPHY (1949-50).—The history of the biography as a literary type; discussion of leading biographers from Boswell to Maurois, with special emphasis upon the development of modern biographical method. Given in alternate years.

3 class hours.

Credit, 3.
Mr. HELMING.

73. (I) THE BIBLE AS LITERATURE.—A study of the King James version of the Bible, with emphasis upon the Hebrew as discernible in translation, the poetic qualities characteristic of Tudor England, and the varied influence of the Bible upon subsequent English poetry.

Mr. RAND, Mr. GOLDBERG.

75. (I) GREEK CLASSICS IN TRANSLATION (1950-51).—Readings and discussion of the epics of Homer, representative dramas of Aeschylus, Sophocles, Euripides, and Aristophanes, the "Socratic" dialogues of Plato, and Thucydides on the Peloponnesian War. Intended to acquaint students with the famous myths and stories of classical antiquity, and the literary forms and ideas which have contributed most to subsequent literatures. Given in alternate years.

3 class hours.

Credit, 3.
Mr. HELMING.

76. (II) MODERN POETRY (1949-50).—This course attempts to trace the spirit of twentieth century poetry from such authors as Hardy, Whitman, and Emily Dickinson to those of the present day. Given in alternate years.

3 class hours.

Credit, 3.
Mr. RAND.

77. (I) THE MODERN NOVEL (1950-51).—An analytical presentation of eleven novels written between 1890 and 1930, in which the expanding form and the extension of critical themes will be stressed. Given in alternate years.

3 class hours.

Credit, 3.
Mr. VARLEY.

79. (I) AN INTRODUCTION TO LITERARY CRITICISM (1949-50).—A study of major critical attitudes and principles, in relation to philosophic background and to practice. Emphasis is placed upon important critics and theorists from Plato and Aristotle through those of the eighteenth century. Given in alternate years.

3 class hours.

Credit, 3.
Mr. GOLDBERG.

80. (II) AN INTRODUCTION TO LITERARY CRITICISM (1949-50).—A continuation of English 79, but may be elected independently. Emphasis is placed upon important critics and theorists of the nineteenth and twentieth centuries. Given in alternate years.

3 class hours.

Credit, 3.
Mr. GOLDBERG.

81. (I) CREATIVE WRITING.—A course in critical and imaginative composition, based upon the example of standard authors and the experience of the student. This course provides an opportunity for work in description, narrative, verse, and drama, as well as in exposition.

3 class hours.

Credit, 3.
Mr. TROY, Mr. VARLEY, Mr. O'DONNELL, Miss HARRIGAN.
Prerequisite, a mark of A or B in English 2 (U. of M.) or permission of the instructor.

83. (I) TECHNICAL WRITING.—For majors in engineering. A course in factual and inductive exposition with special emphasis upon process reports and thesis preparation.

2 class hours.

Credit, 2.
Mr. DIFFLEY.

Prerequisites, English 1, 2.

84. (II) TECHNICAL WRITING.—For students not majoring in engineering. A course in factual and inductive exposition with special emphasis on library research and the preparation of reports, essays and theses.

3 class hours.

Credit, 3.
Mr. DIFFLEY, Mr. VARLEY, Mr. ZAITZ.
Prerequisites, English 1, 2.

85. (I) PRINCIPLES OF JOURNALISM.—A basic course in reporting designed to acquaint the student with the scope, principles, and practice of contemporary journalism. Stress is placed upon the role of the press as a social institution and upon the relationships between a general education and effective journalism.

3 class hours.

Credit, 3.
Mr. MUSGRAVE.

86. (II) JOURNALISTIC TECHNIQUES.—Instruction in writing certain types of news stories, feature and magazine articles. The practice work is related to problems of interpretative writing, communication, and public opinion. Each student is expected to publish a feature article in a newspaper or magazine.

3 class hours.

Credit, 3.

Mr. MUSGRAVE.

Prerequisite, English 85 or permission of the instructor.

ENTOMOLOGY

Professor ALEXANDER, Professor SWEETMAN, Assistant

Professor HANSON, Assistant Professor SHAW,

Dr. SMITH, Mr. FIELD.

26. (II) GENERAL AND FIELD ENTOMOLOGY.—The lectures are devoted to a brief survey of the entire field of entomology; structure and metamorphosis; the more important methods and materials for control of injurious species; a survey of the more conspicuous and important insects with particular attention to the fauna of New England. A laboratory period will be devoted to the preparation and formation of a collection of insects. Until about April 10th, this work will be done indoors and will consist of lectures and practical work preparatory to the field work after that date. Collections made by the students are studied in later courses.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 M. F.; 1:00-2:50 M. Tu. W. Th.

Mr. ALEXANDER, Miss SMITH.

51. (I) PESTS OF SPECIAL CROPS.—For students not specializing in entomology who desire a more complete knowledge of the insects connected with their major lines of work. Work in the laboratory consists of identification, life-history studies and control measures of important insect pests. Work of this nature is available on pests of field crops, market-garden crops, fruits, flowers, shade trees and shrubs, forest trees, household articles, domestic animals, and man.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 M.; 1:00-2:50 Tu.; 2:00-3:50 Th.

Mr. SHAW.

Prerequisite, Entomology 26.

53. (I) APPLIED ENTOMOLOGY.—Studies on the more important insect pests, their life-histories, damage, identification, and methods of control. Special attention is devoted to the use of entomological literature, methods of preparing scientific papers, and the general principles of insect control.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 W.; 3:00-4:50 M. F.

Mr. SHAW.

Prerequisite, Entomology 26.

55. (I) 56. (II) CLASSIFICATION OF INSECTS.—Laboratory work on the identification of the major orders of insects.

In Course 56, the immature stages of insects, with particular stress on their structure and recognition.

3 2-hour laboratory periods.

Credit, 3.

8:00-9:50 Tu. Th. S.

Mr. ALEXANDER, Miss SMITH.

Prerequisites, Entomology 26; Entomology 57, previously or concurrently.

57. (I) INSECT MORPHOLOGY.—The lectures treat of the internal and external anatomy of insects, particular stress being placed on those structures needed in classification, for use in the parallel Course 55. In the laboratory, the internal and external anatomy of the more important groups is studied, with emphasis on those characters most used in the determination of insects.

1 class hour; 3 2-hour laboratory periods.

Credit, 4.

10:00-10:50 F.; 1:00-2:50 M. Tu. F.

Mr. HANSON.

Prerequisite, Entomology 26.

60. (II) STRUCTURAL PEST CONTROL.—For students specializing in entomology, especially those desiring to enter the structural pest field, and others interested in gaining knowledge of methods of combating insect and rodent pests. The emphasis will be placed on the control of those pests attacking buildings and other structures, foods, fabrics, and other stored products in private homes or other establishments. The life history, feeding habits, methods of reproduction, and dispersal of the various species will be stressed in so far as these influence control measures.

2 class hours.

Credit, 2.

Hours by arrangement.

Mr. SWEETMAN.

72. (II) FOREST AND SHADE-TREE INSECT.—The lecture work deals with the principles and methods of controlling insects which attack shade trees, forests and forest products. The laboratory periods are devoted to a study of the more important species, their identification, biology, and specific control measures.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 1:00-2:50 M. F.

Mr. HANSON, Mr. FIELD.

Prerequisite, Entomology 26; 53, 55, 56, and 57 desirable.

74. (II) MEDICAL ENTOMOLOGY.—Diseases of man and animals that are transmitted by insects and other arthropods. Especial attention is given to such transmission under war conditions, and to camp sanitation and similar topics.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Prerequisite, Entomology 26.

Mr. SHAW.

79. (I) ANIMAL ECOLOGY.—Designed for students specializing in entomology, zoology, and related fields. The course deals with the relation of animals to their environment, covering the physical factors as temperature, moisture, light, etc.,

and the biotic factors as neighbors, competitors, predators, etc.. Both terrestrial and aquatic communities are studied. The student is shown not only that animals do things, but why they make definite responses to the environmental factors. Actual measurements of the environmental factors and responses of the animals in the field and laboratory are included.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 3:00-4:50 M. Mr. SWEETMAN.
Prerequisite, Entomology 26 or Zoology 1 or equivalent.

80. (II) INSECT CONTROL.—The scientific basis of insect control is considered from the chemical, biological, ecological, mechanical, and legislative approaches. Special emphasis is placed on the composition, manufacture, preparation, and reaction of insecticides, and the use of resistant hosts, microorganisms and the larger parasites and predators that might be used in the control of insects.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 M.; 3:00-4:50 M. F. Mr. SWEETMAN.
Prerequisites, Entomology 53, 55, and 57; 79 and 81 desirable.

81. (I) PHYSIOLOGICAL ENTOMOLOGY.—A detailed consideration is given to the organ systems, showing the functions such as nutrition, respiration, and growth, and the relationship of physiology to behavior. A portion of the laboratory time will be devoted to assigned individual problems dealing with any phase of insect biology or control and conducted on a research basis.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 W.; 3:00-4:50 W. F. Mr. SWEETMAN.
Prerequisite, Entomology 26; 55, 56, and 57 desirable.

87. (I) 88. (II) SPECIAL PROBLEMS IN ENTOMOLOGY.—Problem work in many fields, as apiculture, biological control and insectary practice, insecticides, morphology, and classification. Intended primarily to introduce qualified students to research methods in some branch of entomology. Excess departmental credits are necessary for election.

Hours by arrangement. Credit, 1, 2, or 3.
THE DEPARTMENT.

Prerequisites, Entomology 26, 53, 55, 57, and should be preceded or accompanied by any other courses in the restricted field of the problem.

90. (II) EVOLUTION.—In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis

of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind; the evolution of human intelligence, languages, culture, institutions, etc., and man's probable future in the light of his past development. Especial consideration is given to the factors of evolution, the basic principles of heredity, variation, and similar topics, with particular reference to their application to human welfare.

2 class hours.

Credit, 2.

10:00-10:50 M. F.

Mr. HANSON.

Apiculture

66. (II) INTRODUCTION BEEKEEPING.—The laboratory work consists of a study of beekeeping equipment and the methods of assembling this material; a study of pollen and honey plants; spring management. The lectures are intended to give the student a broad grasp of the entire field of beekeeping, considering such subjects as history; statistics of beekeeping in America; the races of bees; methods of management; bee-diseases; pollination; queen-rearing.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. F.; 1:00-2:50 M.

Mr. SHAW.

85. (I) ADVANCED BEEKEEPING.—The laboratory work consists of fall management, care of the honey crop, preparation of colonies for wintering, bee-diseases, and some simple types of biometrical problems. The lectures consider, among other things, the physical and chemical characteristics of honey and wax; chemical tests to detect adulteration of honey; bee-diseases; and biometry.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. SHAW.

Prerequisite, Entomology 66.

BIOLOGICAL FIELD STUDIES

Professor VINAL.

51. (I) 52. (II) BIOLOGICAL FIELD STUDIES (1949-50).—Course 51 is devoted to field studies with fall flowers, trees in winter, wood specimens, evergreens and the making of terraria. Course 52 deals with topography, glaciers, minerals, birds, and spring flowers with special emphasis on methods, skills and techniques of leadership in nature education. These courses are required of students specializing in recreational leadership. Enrollment limited to twenty-five. Given in alternate years.

1 class hour; 2 2-hour field periods.

Credit, 3.

Mr. VINAL.

61. (I) 62. (II) PUBLIC RELATIONS IN NATURE RECREATION.—For juniors and seniors specializing in recreational leadership; others may elect by special arrangement with the instructor. A course in public contacts designed to bring to the attention of the student the natural history background with which one must be familiar if he is to succeed in public work. Community facilities, population, land use, climate, housing, good rural life in relation to community planning and nature recreation, are some of the factors to be considered. Each student will be expected to make a survey of his home town.

3 class hours.

Credit, 3.
Mr. VINAL.

71. (I) 72. (II) ADVANCED BIOLOGICAL FIELD STUDIES (1948-49).—This course is devoted to field studies with cultivated plants, bog plants, the seabeach, salt water and fresh water aquaria, terraria, shell fish, amateur weather bureau, conservation, camping education, the observation bee hive, gardening, school and community forests, animals in winter. Community service is expected. Enrollment limited to twenty-five. Given in alternate years.

1 class hour; 2 2-hour field periods.

Credit, 3.
Mr. VINAL.

73. (I) 74. (II) SPECIAL PROBLEMS IN NATURAL SCIENCE.—For juniors and seniors specializing in recreational leadership. It is expected that the problem will relate to the immediate career which the student has in view.

3 class hours.

Hours by arrangement.

Credit, 3.
Mr. VINAL.

FINE ARTS

Assistant Professor ROBERTSON, Assistant Professor ALVIANI,
Mr. SCHABAS.

Art

27. MODELING.—A course in elementary modeling, of seeing, analyzing, and reproducing form in clay and modeling wax to develop sculptural technique.

6 laboratory hours.

Credit, 3.
Mr. ROBERTSON.

28. MODELING.—A continuation of Course 27 in advanced design and the making of plaster casts from original problems in small sculpture, such as plaques, masks, and medals or other such pieces.

6 laboratory hours.

Credit, 3.
Mr. ROBERTSON.

Prerequisite, Art. 27.

31. (I) **ELEMENTARY DESIGN.**—For women. Elementary principles of design as applied to textiles, fabrics, interior decorations, etc.

3 2-hour laboratory periods.

Credit, 3.

Mr. MACIVER.

33. (I) **FREEHAND DRAWING.**—A non-professional course in elementary drawing and painting in various media in black and white. The work is more or less personal and is adapted to the individual capacities and backgrounds of each student as far as possible.

6 laboratory hours.

Credit, 3.

Mr. MACIVER.

34. (II) **FREEHAND DRAWING.**—This non-professional course is essentially one in which the use of color is stressed in various media, freehand drawing is emphasized and paintings in still-life and landscape subjects are produced.

6 laboratory hours.

Credit, 3.

Mr. MACIVER.

75. (I) **ART APPRECIATION.**—An analysis of the principles of critical judgment underlying the fine arts, leading toward the enjoyment of art and its application to every day life.

3 class hours.

Credit, 3.

Mr. OTTO.

77. (I) **EARLY AND MEDIEVAL ART.**—An appreciative survey of art and history from early times through the medieval period. Works in painting, sculpture, architecture, and the minor arts are examined in the light of their contributions to the history of civilization, and to the development of art forms.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. ROBERTSON.

78. (II) **RENAISSANCE AND MODERN ART.**—This course is a continuation of Art 77, bringing the historical survey of art down to modern times. While it is advisable to take both courses, either may be elected independently.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. ROBERTSON.

Music

As an addition to the courses listed below, the department can make arrangements with thoroughly well-qualified teachers to offer private instruction, without course credit, in voice, piano, organ, violin, and viola.

25. (I) **INTERPRETATION OF MUSICAL SYMBOLS.**—The course is designed to introduce simple fundamentals of music, including three distinct but correlated fields: sight singing, ear training, and keyboard harmony. Previous musical experience is not required.

Hours by arrangement.

Credit, 1.

Mr. ALVIANI.

26. (II) CONDUCTED CHORAL AND INSTRUMENTAL MUSIC.

—The aim of this course is to teach the methods of directing choral and instrumental groups. It is arranged so as to acquaint the student with the techniques of conducting, the meanings of musical notation, and with the problems of actual performance. Previous musical experience is desirable, but not required.

Credit, 1.

Hours by arrangement.

Mr. SCHABAS.

51. (I) and (II) DISCOVERING MUSIC.—This elementary course is non-technical in nature and is designed primarily for those students who would like to acquire a general background and knowledge of this great art. With learning to listen its motive, the course deals with the elements of music, forms in music, musical compositions, and with selected composers. Excerpts from the works of great masters will be used as illustrations.

3 class hours.

Credit, 3.

THE DEPARTMENT.

52. (I) and (II) GREAT PERIODS OF MUSIC.—This course attempts to transport the student into the spirit of each of several great periods of music—Renaissance, Baroque, Classic, Romantic, and Modern—so that he will feel their quality, understand their enthusiasms, their technical resources and limitations, and their habits of thought and style.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Music 51.

61. (I) MUSIC OF THE TWENTIETH CENTURY.—By a study of musical trends, during the twentieth century, this course shows the aims, accomplishments, and future plans of the recent and present day composers. Compositions of this century are heard and studied as illustrations of the trends which have caused the twentieth century to be called one of unrest and experiment for music.

2 class hours.

Credit, 2.

9:00-9:50 M. W.

Mr. ALVIANI.

Prerequisite, Music 51 or 52 or permission of instructor.

62. (II) GREAT MASTERPIECES OF MUSIC.—The course includes the history and analysis of selected compositions most frequently heard in the concert hall, on records, and on the radio. The selected works will be masterpieces composed during the last two hundred years by the best known composers.

2 class hours.

Credit, 2.

9:00-9:50 M. W.

Mr. SCHABAS.

Prerequisite, Music 51 or 52 or permission of instructor.

75. (I) HARMONY.—A study of harmonic principle, part writing for voices and small instrumental groups, and ear training. Previous musical experience is desirable, but not required.

3 class hours.

Credit, 3.

11:00-11:50 Tu.; 12:00-12:50 W. Th.

Mr. SCHABAS.

76. (II) ELEMENTARY COMPOSITION AND ARRANGING.—A study of small musical forms, so that they shall serve as models for original compositions. The instruments of the orchestra will be studied and practical work in orchestral scoring assigned as projects.

3 class hours.

Credit, 3.

11:00-11:50 Tu.; 12:00-12:50 W. Th.

Mr. SCHABAS.

Prerequisite, Music 75.

FLORICULTURE

Professor THAYER, Assistant Professor HUBBARD, Assistant Professor ROSS, Mr. DUNHAM.

26. (II) GARDEN MATERIALS.—A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants, and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture, and uses of the various plants are considered as well as identification of materials.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. F.; 3:00-4:50 M.

Mr. DUNHAM.

51. (I) GREENHOUSE MANAGEMENT.—This course is intended to familiarize students with the methods and principles involved in the management of greenhouses and greenhouse crops; history and development of the floricultural industry, preparation of soils, fertilizers, potting, watering, ventilation, control of insects and diseases, methods of plant propagation, forcing of plants, soilless methods of plant culture. At some time during the semester the members of the class will be required to take a one-day trip to visit large commercial establishments at an approximate cost of five dollars.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 3:00-4:50 F.

Mr. THAYER, Mr. ROSS.

52. (II) FLORAL ARRANGEMENT.—A study of the principles involving the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangements, corsages, wedding bouquets, table decorations, home, church, and other interior decorations. A study of color and color harmony as applied to such work. This course is limited to ten students, preference being given to students specializing in floriculture and landscape architecture.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. ROSS.

8:00-8:50 Th.; 1:00-2:50 M. F.

54. (II) GREENHOUSE CONSTRUCTION AND HEATING.—The location, types, arrangement, construction, cost, equipment, heating, and ventilation of greenhouse structures; the drawing of plans and study of specifications. Special emphasis laid on heating problems.

2 class hours; 1 2-hour laboratory period. Credit, 3.

9:00-9:50 M. F.; 3:00-4:50 F. Mr. THAYER, Mr. DUNHAM.

58. (II) AMATEUR FLORICULTURE.—This course is intended primarily for major students in the School of Home Economics and for other women students. Three phases of floriculture will be considered: (1) the arrangement and use of cut flowers for decorative purposes in the home and elsewhere, (2) house plants, methods of propagation, (3) garden flowers and their uses on the home grounds.

2 class hours; 1 2-hour laboratory period. Credit, 3.

11:00-11:50 Tu.; 1:00-1:50 Th.; 1:00-2:50 W. or 2:00-3:50 Th.

Mr. THAYER, Mr. ROSS.

75. (I) 76. (II) COMMERCIAL FLORICULTURE.—A detailed study of the cultural methods for the important commercial cut-flower crops and potted plants. The marketing of flowers and plants, including the management of wholesale markets and retail stores, a study of systems of record keeping, cost analysis, inventory methods, and other phases of this important part of the floricultural industry. Trips may be taken to nearby commercial establishments.

2 class hours; 1 2-hour laboratory period. Credit, 3.

9:00-9:50 Tu., Th.; 1:00-2:50 Tu. Mr. HUBBARD.

Prerequisite, Floriculture 51.

79. (I) CONSERVATORY PLANTS (1948-49).—Alternates with Course 81 for students specializing in floriculture. A study of the foliage and flowering plants used in conservatory work; methods of propagation; identification of materials.

1 class hour; 1 2-hour laboratory period. Credit, 2.

3:00-3:50 W.; 1:00-2:50 F. Mr. THAYER, Mr. DUNHAM.

81. (I) HERBACEOUS GARDENS AND BORDERS.—Alternates with Course 79 for students specializing in floriculture; given annually for students specializing in landscape architecture. This course is a continuation of Course 26 with emphasis on the use of herbaceous materials in various types of planting of borders and gardens.

1 class hour; 1 4-hour laboratory period. Credit, 3.

10:00-10:50 Tu.; 1:00-4:50 M. Mr. HUBBARD.

Prerequisite, Floriculture 26.

82. (II) SEMINAR.—For seniors specializing in floriculture. Presentation and discussion of research work in floriculture and other related fields.

1 class hour; 4 laboratory hours.

Credit, 3.

Mr. THAYER.

FOOD TECHNOLOGY

Professor FELLERS, Assistant Professor LEVINE, Assistant Professor KRANZ, Dr. FITZPATRICK,* Mr. ZALKAN.

51. (I) **INTRODUCTORY COURSE.**—This is a general elementary course covering food economics, production, distribution and processing. The applications of fundamental science to the food industries are pointed out. The laboratory exercises cover both the theory and practice of canning, freezing and dehydration. The principles of packaging are considered. Fruit and vegetable products are prepared and graded.

1 class hour; 1 4-hour laboratory period.

Credit, 3.

8:00-8:50 Tu.; 1:00-4:50 W. or Th.

Mr. FELLERS.

52. (II) **FOOD PRODUCTS AND ADJUNCTS.**—This is a continuation of Course 51. The laboratory work includes pickles and pickle products, maple products, citrus products, fruit syrups, soups, condiments, and the preservation of meats, poultry, and vegetables. The properties and uses of sugars, syrups, brines, enzymes, acids, salt, pectin, preservatives and antioxidants are considered. Experience is given in the use and handling of instruments and equipment. Enrollment is limited to 25.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 1:00-2:50 W. or Th.

Mr. FELLERS.

Prerequisite, Food Technology 51.

61. (I) **INDUSTRIAL TECHNOLOGY.**—A survey of commercial practices in the manufacture and preservation of food products. This will involve a study of equipment, factory arrangement, sanitation, government regulations, and the operation of types of commercial equipment in quantity production.

1 class hour; 1 4-hour laboratory period.

Credit, 3.

11:00-11:50 Th.; 1:00-4:50 M. or Tu.

Mr. LEVINE.

Prerequisites, Food Technology 52; Bacteriology 31.

62. (II) **INDUSTRIAL TECHNOLOGY.**—This is a continuation of Course 61. The class exercises will deal largely with a survey study of the sources of raw material, commercial methods of manufacture, packing and distribution of the more common foods. The important contributions of research to food technology will be studied. Laboratory work will include the formation of research projects, interpretation of research data, the use of preservatives, the simple analysis of foods and the commercial practices as applied to preservation of such materials as are available: fish, meats, poultry, and spring vegetables. The inspection and grading of canned

* On leave of absence for military service.

food will be studied. Sometime during the semester a two-day field trip to food plants in the Boston area will be taken. The trip will cost the student about fifteen dollars.

1 class hour; 1 4-hour laboratory period. Credit, 3.

Hours by arrangement. Mr. LEVINE.

Prerequisite, Food Technology 61.

71. (I) 72. (II) FOOD SCIENCE LITERATURE.—For seniors who specialize in food technology.

2 class hours. Credit, 2.

11:00-11:50 M. W. THE DEPARTMENT.

75. (I) and (II) FOOD PRESERVATION.—For students not majoring in food technology. A survey is made of the causes of food spoilage and of the methods commonly used in preserving foods. The important food products are discussed with emphasis on raw materials used, processing methods and examination of packaged foods. Methods of detecting and preventing spoilage are studied. The laboratory exercises cover the preservation of the major food groups. The theory and use of the pressure cooker are included.

2 class hours; 1 2-hour laboratory period. Credit, 3.

12:00-12:50 Tu. Th.; 3:00-4:50 M. or Th. Mr. ZALKAN.

82. (II) CONFECTIONS AND CEREAL PRODUCTS.—The materials offered in this course are as follows: the home manufacture of fruit preserves, candied and glacéed fruits, pastes, confections, candies, and other specialties. Approximately one-half the semester is devoted to elementary work in candy making. This course will also consider the principles of baking, doughs, various cereal products and dry mixes.

2 2-hour laboratory periods. Credit, 2.

1:00-2:50 M. F. or 3:00-4:50 M. F. Mr. LEVINE.

85. (I) 86. (II) MARINE PRODUCTS TECHNOLOGY.—A survey of marine products of commerce and industry. Canning, curing, and freezing of seafoods. Chemical and microbiological aspects of the industry. By-products, industrial problems and scientific literature. Emphasis is placed on the New England fisheries.

1 class hour; 1 2-hour laboratory period. Credit, 2.

Mr. FELLERS.

91. (I) EXAMINATION OF FOOD PRODUCTS.—Laboratory studies on the grading of foods, examination of foods for adulteration, testing accessory products for quality, and determining the causes of spoilage or deterioration in processed food products. Physical, chemical, microbiological, and microscopical methods will be employed. Enrollment limited to 18.

1 class hour; 1 4-hour laboratory period. Credit, 3.

9:00-9:50 Th.; 1:00-4:50 Th. or F. Mr. FELLERS.

Prerequisites, Food Technology 52; Bacteriology 31; Chemistry 30.

92. (II) EXAMINATION OF FOOD PRODUCTS.—For students specializing in food technology. This is a continuation of Course 91. It includes interpretation of analysis, sanitation and food laws, government grading of processed foods, use of manuals and the technical work of trade associations. Laboratory work includes use of all kinds of laboratory and field equipment and apparatus used in food plants. A separate laboratory section is given for Bacteriology and Public Health majors.

1 class hour; 1 4-hour laboratory period. Credit, 3.

9:00-9:50 Th.; 1:00-4:50 Th. or F. Mr. FELLERS.

Prerequisite, Food Technology 91.

95. (I) and (II) INTRODUCTORY RESEARCH METHODS.—For food technology majors. The application of the fundamental sciences to food technology research.

Hours by arrangement.

Credit, 2.

THE DEPARTMENT.

FORESTRY AND WILDLIFE MANAGEMENT

Professor HOLDSWORTH, Professor TRIPPENSEE, Professor RHODES, Associate Professor RICH, Assistant Professor STICKEL, Mr. COLE, Mr. MACCONNELL.

26. (II) DENDROLOGY.—The taxonomic features, silvical characteristics, and geographical distribution of the trees of temperate North America, especially those of economic importance and the forests in which they occur; identification of the native and naturalized woody plants occurring in the forests of the northeastern United States, in summer and winter condition, by means of artificial keys and first-hand examination.

2 class hours; 2 2-hour laboratory and field periods.

Credit, 3.

Mr. RHODES.

51. (I) FOREST MANAGEMENT OF WATERSHEDS.—For students majoring in bacteriology and public health. Admission on recommendation of student's major adviser. A study of forest site—water factor relationships; the improvement of watershed forests through applied silviculture; relative suitability of tree species for watershed uses; forest protection measures.

3 class hours; special field trips.

Credit, 3.

THE DEPARTMENT.

52. (II) FOREST PHOTOGRAMMETRY.—A course designed to familiarize the student with the use of aerial photographs in present-day forest management practice. Map making, forest inventory and other phases of forest management involving the application of photogrammetry are considered in

detail. Field trips for checking photographic detail on the ground and inspection of photogrammetric equipment will be made. Texts and equipment costing about \$22.00 are required.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Mr. MACCONNELL, Mr. COLE.

53. (I) **SILVICS.**—Forest ecology as a foundation for silvicultural practice: the physiological basis of forest ecology; environmental factors from an ecological viewpoint, their effect upon vegetation, and how they are influenced by it; the development and silvical habits of the individual tree; the development, characteristics and classification of forest communities; plant indicators; methods for the study and analysis of vegetation and its environment.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Mr. RHODES.

54. (II) **FOREST SOILS.**—The structure, development and maintenance of forest soils; their relationship to applied silviculture and forest productivity; the literature of forest soils with special reference to American experience.

3 class hours. Credit, 3.
Mr. RHODES.

55. (I) **THE ELEMENTS OF FOREST MENSURATION.**—Methods of determining the volume and value of the forest growing stock; type mapping as it pertains to timber cruising; methods of predicting growth of trees and stands; the field work includes mapping and timber estimating on a forest realistic in size and condition.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Mr. HOLDSWORTH.

56. (II) **THE PRINCIPLES OF SILVICULTURE.**—The methods of establishing and developing forest stands through the application of correct silvicultural practice. Intermediate cuttings and reproduction systems. Field work in applied silviculture, including the marking of forest stands for silvicultural treatment, is given on University forest property.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Mr. HOLDSWORTH, Mr. RHODES, Mr. STICKEL.

57. (I) **FOREST ECONOMICS AND POLICY.**—The first third of this course deals with the history of American forestry and the development of a forest policy. The rest deals with the forest as a national resource yielding both measurable material forest values and social benefits. The role of the forest in American economy is considered.

3 class hours. Credit, 3.
Mr. HOLDSWORTH.

59. (I) **FOREST PROTECTION.**—The principles of protecting forests from all harmful agencies but with special reference to the prevention and control of forest fires and disease. Other agencies are treated in accordance with their importance.

3 class hours.

Credit, 3.
Mr. STICKEL.

66. (II) **WOOD ANATOMY AND IDENTIFICATION.**—A basic anatomical study of wood elements, their various structural characteristics and functions. Relation of structure and properties to use. Microscopic study of wood elements. Practice in identification.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Mr. RICH.

75. (I) **MANUFACTURE AND DISTRIBUTION OF FOREST PRODUCTS.**—A study of the techniques of manufacturing direct forest products, including production and cost studies; also the seasoning, grading and special processing prerequisite to marketing.

3 class hours.

Credit, 3.
Mr. RICH.

76. (II) **WOOD TECHNOLOGY.**—The structure, composition and properties of wood in relation to its economic utilization; wood-liquid relationships as they affect seasoning, preservation, and technological processes for industrial purposes. A survey of the technological advances in the use of wood.

3 class hours.

Credit, 3.
Mr. RICH.

78. (II) **HARVESTING OF FOREST PRODUCTS.**—Methods of harvesting forest products in the several forest regions of the United States with a study of the uses of modern machinery and techniques. Cost control as a factor in the development of harvesting methods and policies.

3 class hours.

Credit, 3.
Mr. RICH.

80. (II) **PRINCIPLES OF FOREST MANAGEMENT.**—The organization of the forest for sustained yield management with a study of the underlying principles. Forest regulation. The preparation of forest management plans.

2 class hours; 1 4-hour field and laboratory period. Credit, 3.
Mr. HOLDSWORTH.

81. (I) **REGIONAL SILVICULTURE.**—The practice of silviculture as applied in the several forest regions of the United States with special reference to the treatment of the tree species of commercial importance. Emphasis is given to the factors, both natural and economic, which govern silviculture in these regions.

3 class hours.

Credit, 3.
Mr. RHODES.

82. (II) SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY.—A study of forest tree seeds and their characteristics, production, harvest, storage, and qualities of germination. The production, distribution, and forest use of planting stock. 1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. STICKEL.

85. (I) AIR SEASONING AND KILN DRYING.—A study of the proper conditioning of wood products by air seasoning and kiln drying. Laboratory work includes studies of moisture relations in the wood and a study of kiln operation.

3 class hours.

Credit, 3.

Mr. RICH.

Wildlife Management

27. (I) CONSERVATION OF NATURAL RESOURCES.—Natural resources of the United States including soil, water, forests, wildlife, and the important minerals, the historic background of their use and their present status in relation to the social and economic welfare. Includes the discussion of various conservation problems in relation to national prosperity.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. TRIPPENSEE.

70. (II) WILDLIFE MANAGEMENT.—Life histories, ecology, and management of common game birds and mammals. Includes a study of natural habitats and methods of management.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

3:00-4:50 W. F.; lecture by arrangement.

Mr. TRIPPENSEE.

71. (I) WILDLIFE MANAGEMENT (1950-51).—Life histories, ecology, and management of waterfowl. Includes a study of natural habitats and method of management. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. TRIPPENSEE.

72. (II) FOREST-ANIMAL RELATIONSHIPS.—Only for students majoring in Forestry. Effects of animals on the forest; the effects of forest practices on wild animal production; economic aspects of forest-animal relationships.

3 class hours.

Credit, 3.

Mr. TRIPPENSEE.

73. (I) WILDLIFE MANAGEMENT.—Life histories, ecology, and management of predaceous birds and injurious mammals. Particularly designed for those who seek employment with rodent control division of Fish and Wildlife Service.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. TRIPPENSEE.

74. (II) **TECHNIQUES IN WILDLIFE MANAGEMENT.**—Admission by permission of instructor. Quantitative field studies of wild animals of forest and farm. Includes cover mapping, habitat studies, census, food habits, and damage of game animals. For students interested in state and federal employment through civil service.

1 class hour; 1 4-hour laboratory period. Credit, 3.
1:00-1:50 W.; 1:00-4:50 M. Mr. TRIPPENSEE.

75. (I) **WILDLIFE MANAGEMENT (1949-50).**—Life histories, ecology, and management of the furbearers. Includes a study of natural habitats, management and fur farm problems. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. TRIPPENSEE.

GEOLOGY AND MINERALOGY

Professor WILSON, Assistant Professor NELSON,
Mr. JOHANSSON.

27. (I) **PHYSICAL GEOLOGY.**—An introduction to the agents and processes that modify the earth's crust. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 1:00-2:50 M. Tu. W. Th. or F.
Mr. WILSON, Mr. NELSON.

28. (II) **HISTORICAL GEOLOGY.**—A survey of geological time, stressing the development of continents and the history of plants and animals. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 1:00-2:50 M. Tu. W. Th. or F.
Mr. WILSON, Mr. NELSON.

50. (I) **ENGINEERING GEOLOGY.**—A general course in engineering geology stressing earth structure, the dynamic processes, and agents of weathering. The laboratory work consists of mineral and rock-determination and map-reading as related to the phenomena of physical geology.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. WILSON.

51. (I) **MINERALOGY.**—A descriptive study. Stress is placed upon the identification and occurrence of minerals.
1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 M. F. Mr. NELSON.

52. (II) **PETROLOGY.**—A descriptive study of the classes of rocks with reference to manner of origin, modes of occurrence, structural features and the chemical and petrographic distinction within each group.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 M. F. Mr. NELSON.

54. (II) ECONOMIC GEOLOGY.—A course dealing with the origin, classification, and uses of metallic and non-metallic mineral deposits.

3 class hours.

Credit, 3.

Mr. NELSON.

Prerequisites, Geology 27; Chemistry 1 and 2.

61. (I) PHYSIOGRAPHY AND REGIONAL GEOLOGY—EASTERN UNITED STATES (1950-51).—A systematic study of the topography and geological features of the eastern United States. Field trips by arrangement. Given in alternate years.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. WILSON.

62. (II) PHYSIOGRAPHY AND REGIONAL GEOLOGY—WESTERN UNITED STATES (1948-49).—A systematic study of the topography and geological features of the western United States. Given in alternate years.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. WILSON.

63. (I) INVERTEBRATE PALEONTOLOGY (1949-50).—A study of the history, development and identification of invertebrate animal fossils. Field trips by arrangement. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 W.; 10:00-11:50 M. F.

Mr. WILSON.

64. (II) PLANT PALEONTOLOGY (1949-50).—A study of the history, development, and identification of plant fossils. Field trips by arrangement.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 W.; 10:00-11:50 M. F.

Mr. WILSON.

71. (I) 72. (II) SPECIAL PROBLEMS.—For seniors specializing in geology.

6 laboratory hours.

Credit, 3.

Hours by arrangement.

Mr. WILSON, Mr. NELSON.

GERMAN

Professor JULIAN, Professor GRAHAM,* Associate Professor ELLERT, Assistant Professor ASCHER,* Miss GRAYSON,#
Mr. TIBBETTS, Mr. STAWIECKI.

1. (I) 2. (II) ELEMENTARY GERMAN.—Grammar, prose composition, and reading. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours.

Credit, 3.

THE DEPARTMENT.

* Visiting Professor.

On leave of absence.

5. (I) 6. (II) **ADVANCED GERMAN PROSE.**—Reading of representative German authors. Grammar review.

3 class hours.

Credit, 3.

8:00-8:50 Tu. Th. S.

Miss GRAYSON.

Prerequisite, Entrance German.

25. (I) 26. (II) **INTERMEDIATE GERMAN.**—German prose and poetry; the simpler German drama; grammar review and advanced prose composition. Simpler passages of prose and poetry to commit to memory.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, German 1 and 2.

51. (I) 52. (II) **NINETEENTH CENTURY LITERATURE.**—A survey of German thought in the Nineteenth Century.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. ELLERT.

Prerequisites, German 25 and 26.

55. (I) 56. (II) **"STORM AND STRESS" AND ROMANTICISM.**—The "Storm and Stress" period of German literature, with study of the early plays of Goethe and Schiller. The Romantic period from Novalis to Heine, with study of poets, prose writers, critics, and philosophers.

3 class hours.

Credit, 3.

Mr. ELLERT.

Prerequisites, German 25 and 26.

57. (I) 58. (II) **GOETHE'S FAUST.**

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. JULIAN.

Prerequisites, German 25 and 26.

59. (I) 60. (II) **THE CLASSICAL PERIOD.**—Reading and study of some important literary productions of the classical period.

3 class hours.

Credit, 3.

8:00-8:50 Tu Th. S.

Mr. ELLERT.

Prerequisites, German 25 and 26.

79. (I) 80. (II) **CONVERSATIONAL GERMAN.**—Admission only by arrangement with the head of the department. Practice in the oral use of German, based on reading material prepared in advance.

3 class hours.

Credit, 3.

Hours by arrangement.

Miss ASCHER.

Prerequisites, German 25 and 26.

81. (I) 82. (II) **SCIENTIFIC GERMAN.**—Only seniors admitted, except by permission of the instructor. Intensive

and specialized reading of literature taken from standard German scientific journals and reference books.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. JULIAN.

Prerequisites, German 25 and 26.

HISTORY

Professor CALDWELL, Professor CARY, Assistant Professor PIERCE, Assistant Professor DAVIS, Mr. SCOTT, Mr. ZEENDER.

5. (I) 6. (II) MODERN EUROPEAN CIVILIZATION.—The first semester covers the period from the early Middle Ages to 1815; the second semester, the period from 1815 to the present. These courses are required for candidates for the B.A. degree but may be elected independently by other students.

THE DEPARTMENT.

31. (I) 32. (II) ENGLISH HISTORY.—Emphasis on economic, social, and cultural influences, as well as on constitutional development. Either semester may be elected independently.

3 class hours.

Credit, 3.

Mr. CALDWELL.

53. (I) INTERNATIONAL RELATIONS.—A course dealing with the development and practices of international relations, the diplomatic and consular services of states, the nature of nationalism and imperialism, the basic factors determining a nation's foreign policy, and the earlier evolution toward supranational government.

3 class hours.

Credit, 3.

Mr. PIERCE.

54. (II) THE FAR EAST IN MODERN TIMES (1950-51).—After a brief and selective survey of earlier Oriental history and culture the emphasis is upon India, China, and Japan since the impact of western technology. Considerable attention is paid to contemporary political, economic, and diplomatic problems. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PIERCE.

56. (II) THE HISTORY OF MODERN RUSSIA (1949-50).—This course is a study of Russia in both Europe and Asia since 1800. The major topics considered are: Tsarist government and society; diplomacy and expansion; political, intellectual, and economic unrest; reforms and the Duma; World War I and the Communist Revolution; recognition and experimentation; World War II; the U.S.S.R. as an Eurasian World Power. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PIERCE.

Prerequisite, History 6 or permission of instructor.

57. (I) 58. (II) **HISPANIC-AMERICAN HISTORY.**—A general course in the history and civilization of the Americas south of the United States. The first semester deals with the periods of exploration, organization, and revolution to 1824; the second semester, with the period of national independence and growth from 1824 to the present. Either semester may be elected independently.

3 class hours.

Credit, 3.
Mr. PIERCE.

59. (I) 60. (II) **HISTORY OF THE UNITED STATES.**—A survey of the national development including political, social, economic, and cultural factors in the growth of American democracy. The first semester covers the period to 1865; the second, from 1865 to the present. Either semester may be elected independently.

3 class hours.

Credit, 3.
Mr. CARY.

61. (I) **ANCIENT GREEK HISTORY (1950-51).**—Given in alternate years.

3 class hours.

Credit, 3.
Mr. DAVIS.

63. (I) **ANCIENT ROMAN HISTORY (1949-50).**—Given in alternate years.

3 class hours.

Credit, 3.
Mr. DAVIS.

65. (I) **NINETEENTH AND TWENTIETH CENTURY ENGLAND (1949-50).**—Victorian society and ideals; Industrial Revolution and its effects; growth of democracy; imperial development. Emphasis on social conditions and thought movements. Given in alternate years.

3 class hours.

Credit, 3.
Mr. CALDWELL.

Prerequisite, History 32.

67. (I) **TUDOR AND STUART ENGLAND (1950-51).**—A brief survey of the Tudor Period followed by a detailed study of Early Stuart England. Particular emphasis is placed on social, religious, and intellectual aspects of English life in the period. Given in alternate years.

3 class hours.

Credit, 3.
Mr. CALDWELL.

Prerequisite, History 31 or 32.

69. (I) **EUROPE, 1870-1918.**—Internal developments of the principal countries, including political and economic changes, social unrest, and intellectual currents; the development of imperialism; a detailed study of conditions and

diplomacy which led to the World War; military history of the War.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 6 or 32.

70. (II) EUROPE SINCE 1918.—A continuation of History 69, but may be elected independently. Approximately half of the course is devoted to international affairs, including the Peace Settlement, the development of German, Italian, and Japanese aggression, and World War II. The other half of the course is a study of internal developments in the principal European nations.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 6 or 32, or permission of the instructor.

72. (II) HISTORY OF AMERICAN WESTWARD EXPANSION, 1763-1893.—Advance of settlement from the Appalachians to the Pacific and influence of the frontier upon social, economic, and political conditions in the country as a whole.

3 class hours.

Credit, 3.

Mr. DAVIS.

Prerequisite, History 59.

75. (I) MEDIEVAL EUROPE.—Europe from the barbarian invasions to the Renaissance. Social and economic conditions, development of national monarchies, the Church and religion, medieval culture.

3 class hours.

Credit, 3.

Mr. ZEENDER.

76. (II) HISTORY OF THE RENAISSANCE.—The later Middle Ages; the Church at the height of power; the rise of nationalities; the Italian towns; the New Learning and its relation to art, science, invention, geographical discoveries; spread and effects of the Renaissance.

3 class hours.

Credit, 3.

Mr. ZEENDER.

81. (I) DIPLOMATIC HISTORY OF THE UNITED STATES. 1776-1900.—The history of American foreign policy and its basic factors to the end of the nineteenth century.

3 class hours.

Credit, 3.

Mr. CARY.

Prerequisites, History 59 and 60 or permission of instructor.

82. (II) DIPLOMATIC HISTORY OF THE UNITED STATES SINCE 1900.—The history of the United States as a world power.

3 class hours.

Credit, 3.

Mr. CARY.

Prerequisites, History 59 and 60 or permission of instructor.

91. (I) HISTORICAL BIBLIOGRAPHY.—The student will be expected to know the principal secondary works and some of the more important source collections in various fields of history. Training in the assembling of a bibliography on special topics.

1 class hour.

Credit, 1.
Mr. CARY.

92. (II) SEMINAR.—Principles of historical criticism and research.

1 class hour.

Credit, 1.
Mr. CARY.

HOME ECONOMICS

Professor MITCHELL, Assistant Professor BRIGGS, Assistant Professor MERRIAM, Assistant Professor COOK, Assistant Professor PIATT, Assistant Professor JANE, Miss DAVIS, Mrs. THIES, Mrs. WILHELM.

1. (I) INTRODUCTION TO HOME ECONOMICS.—The course introduces the student to the objectives in Home Economics and the fields of specialization for which it prepares. Consideration is given to a philosophy of living which emphasizes the responsibility of a woman to her family, to her community wherever she is, and to the world. Introductory work is offered in food and nutrition, child development and family life. Laboratory work includes food selection and simple preparation, and observation in the Nursery School.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-9:50 Tu. Th. S. reserved for special group projects.

Mrs. PIATT.

2. (II) CLOTHING SELECTION.—A study of the principles of clothing selection in order to assist each student to choose satisfactorily line, color, and texture. Fundamentals of construction for cotton and linen.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mrs. WILHELM.

26. (II) TEXTILES.—A study of fiber, yarn, finish, color and design. Acquaintance with a wide variety of fabrics is afforded to develop judgment in buying and using materials for clothing and home furnishing.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss BRIGGS.

30. (II) FOODS AND FOOD PREPARATION.—A study of fundamental principles and comparative methods of food preparation and home preservation, with emphasis on the nutritional and economic aspects of foods.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Miss DAVIS.

31. (I) APPLIED DESIGN.—Art principles are studied with many practical applications for selecting and arranging. Specific problems in decorating cloth, wood, and leather afford opportunity for individual expression.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Miss BRIGGS.

51. (I) FOOD SELECTION AND MEAL PLANNING.—Meal planning, serving and etiquette with emphasis on well-balanced meals as to nutritive value and economy of money, time, and labor in preparation. Further study of food principles and techniques of cookery.

2 class hours; 1 4-hour laboratory period.

Credit, 3.

Miss DAVIS.

Prerequisite, Home Economics 30; Chemistry 31 and 32.

52. (II) NUTRITION AND DIETETICS.—A study of the fundamentals of normal nutrition including energy needs, the metabolism of proteins, carbohydrates, fats, vitamins, and minerals; and the quantitative requirements for these various essential nutrients. Laboratory work provides for further study of the composition of foods and their contribution to the diet and the relationship of the nutritive value to cost. Nutritive loss due to cooking, storage, etc. is given consideration.

3 class hours; 1 2-hour laboratory period.

Credit, 3.

Mrs. COOK.

Prerequisites, Home Economics 30; Chemistry 31 and 32 or Zoology 35.

54. (II) NUTRITION.—For students who are not majoring in Home Economics and who do not have prerequisites for Home Economics 52. This course is designed to interpret the technical knowledge of foods and nutrition in terms of its practical application for optimum health.

2 class hours.

Credit, 2.

Mrs. COOK.

56. (II) FOOD PREPARATION AND MEAL PLANNING.—For students not majoring in home economics. This course is designed to meet the needs of those who wish a general knowledge of the basic food principles. It will include latest methods and techniques of cookery, conservation of nutrients, menu planning and food preparation, buying of food, consumer education and table service, decoration and etiquette. It is recommended for students who want a scientific as well as practical knowledge of food and its preparation for everyday use.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Miss DAVIS.

57. (I) CLOTHING SELECTION AND SIMPLE CONSTRUCTION.—For students not majoring in home economics. This course

is designed to stimulate an interest in good workmanship. Emphasis is given to construction technique such as fitting, pattern use and altering.

2 3-hour laboratory periods.

Credit, 2.
Mrs. WILHELM.

60. (II) HOUSEHOLD EQUIPMENT AND TECHNIQUES.—Selection, care and operation of household equipment and the study of the mechanical principles involved. Student demonstrations given for practice with all types of equipment. Study of home lighting and wiring. Outside demonstrations and field trips are planned.

2 class hours; 1 2-hour laboratory period.

Credit, 3.
Miss MERRIAM.

61. (I) CLOTHING DESIGN AND CONSTRUCTION.—Principles of construction are given through the use of commercial patterns and handling of wash fabrics. Flat pattern design is stressed with each student making her own design in silk or rayon.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Mrs. WILHELM.

Prerequisite, Home Economics 2 or 57 or equivalent.

62. (II) HOME FURNISHING.—A study of the fundamental principles which underlie the successful planning and furnishing of a satisfying home. A study of period homes and furnishings is included. Many applications of these principles are worked out in practical problems.

1 class hour; 2 2-hour laboratory periods.
11:00-11:50 W.; 1:00-2:50 M. F.

Credit, 3.
Miss BRIGGS.

75. (I) ECONOMICS OF THE HOUSEHOLD.—A study of personal and family standards of living in the modern home, the economic relations of the household, and the use of time, energy, and money as a means to influence the home situation.

3 class hours.

8:00-8:50 M. W. F.

Credit, 3.
Miss MERRIAM.

77. (I) and (II) HOME MANAGEMENT PRACTICE.—Successive groups of seniors live in the home management house and assume responsibilities involved in managing a home. Meals are planned on low, medium, and high income levels.

Credit, 3.
Miss MERRIAM.

Prerequisites, Home Economics 51, 52, and 75, or by special permission.

80. (II) FAMILY LIFE.—A study of the modern family; ideals and responsibilities of the home and the individual's share in developing positive family relationships.

3 class hours.
9:00-9:50 M. W. F.

Credit, 3.
Mrs. PIATT.

81. (I) METHODS OF TEACHING HOME ECONOMICS.—A study of general education philosophy; the application of home economics to the entire school program; development of curricula based upon student needs; exploration of instructional methods and techniques. This course gives credit toward meeting state standards for teachers.

3 class hours.

Credit, 3.
Mrs. PIATT.

83. (I) and (II) STUDENT TEACHING IN HOME ECONOMICS.—Observation and supervised teaching are carried on in the home economics classes in the nearby junior and senior high schools.

Credit, 3.
Miss MERRIAM, Mrs. PIATT.

Prerequisite, Home Economics 81 or its equivalent.

84. (I) and (II) PROBLEMS IN HOME ECONOMICS.—By arrangement with the Dean of the School. An intensive application of home economics to special problems.

2 class hours; 1 2-hour laboratory period.

Credit, 3.
HOME ECONOMICS STAFF.

86. (II) CHILD DEVELOPMENT.—The growth and development of the child, his basic needs, aspects of behavior—routine, creative, and social—as they are related to personality development. Planned observation and participation in Nursery School.

3 class hours; 1 hour laboratory.
8:00-8:50 M. W. F.

Credit, 3.
Mrs. THIES.

87. (I) PRINCIPLES AND PRACTICES OF TAILORING.—Emphasis on handling of wool in the making of suits and coats. 1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Miss BRIGGS.

Prerequisite, Home Economics 61 or equivalent.

88. (II) APPLIED DRESS DESIGN.—Costume design by drawing and draping, using textures of unusual nature. Emphasis will be placed on fitting and adapting design to the figure.

3 2-hour laboratory periods.

Credit, 3.
Miss BRIGGS.

Prerequisite, Home Economics 87 or equivalent.

89. (I) DIET THERAPY.—The application of nutrition principles to diet in disease. Recent theories of dietary treatment of gastro-intestinal disorders, obesity, anemia, fevers, diabetes, food allergy, cardiovascular and biliary tract diseases are reviewed critically. Students are required to use and be familiar with current medical literature as it applies to nutritional problems in disease and at the same time be

open-minded regarding new development in this field. Scientific and medical terminology is emphasized.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mrs. Cook.

Prerequisites, Home Economics 52; Chemistry 79; Zoology 35.

90. (II) NUTRITION SEMINAR.—For qualified seniors. Reading and oral reports of scientific literature and preparation of bibliographies.

1 class hour.

Credit, 1.

Mrs. Cook.

91. (I) 92. (II) INSTITUTIONAL FOODS AND MANAGEMENT.—For qualified seniors interested in institutional food service. A study of the principles of organization, personnel management, the administration, food costs, operating expenses, and the special functions of the dietitian. Laboratory work at the College Dining Hall and dormitories. It is expected that students will enroll for the work of both semesters. Students wishing to qualify for administrative institutional work are advised to take Economics 51.

First semester, 1 class hour; 1 4-hour laboratory period.

Credit, 3.

Second semester, 2 class hours; 1 2-hour laboratory period.

Miss JANE.

Prerequisite, Home Economics 51 and 52.

93. (I) EXPERIMENTAL FOODS.—The testing and comparing of different food materials and methods of preparation, including advanced work in the science and techniques of cookery. Special individual problems will be studied. The course is helpful to those interested in commercial food testing and valuable to those wishing to develop a scientific approach to the study of foods.

2 2-hour laboratory periods.

Credit, 2.

Miss DAVIS.

Prerequisites, Home Economics 51; and permission of instructor.

95. (I) CHILD NUTRITION.—A study is made of nutritional needs from prenatal life through infancy and childhood. Methods of judging nutrition, also causes and effects of malnutrition are discussed. Menus for children and measures to insure the consumption of optimal diets are put into practice with laboratory work in the Nursery School.

3 class hours. Laboratory by arrangement.

Credit, 3.

Mrs. Cook.

Prerequisite, Home Economics 52 or 54.

HYGIENE

HYGIENE.—All freshmen are required to attend a series of lectures on personal hygiene. For men students these lectures are included in the Military program; for women students they are scheduled as a separate course.

Credit, 1.

THE HEALTH SERVICE STAFF.

LANDSCAPE ARCHITECTURE

Professor OTTO, Professor BLUNDELL, Assistant Professor ROBERTSON, Mr. PROCOPIO, Mr. MACIVER, Mr. DURELL.

Landscape Architecture

25. (I) FREEHAND DRAWING AND ELEMENTARY DESIGN.—For majors in landscape architecture. The work in this course is to supply the student with technical aspects of freehand drawing and design necessary to proficiency in that field.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. MACIVER.

26. (II) LANDSCAPE DRAFTING.—This course continues the work in Landscape Architecture 25, but draws on the mechanical aspects of the designers problems and includes simple projections—orthographic, perspective, and isometric—and architectural shades and shadows.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. MACIVER.

51. (I) ELEMENTS OF TOPOGRAPHY AND CONSTRUCTION.—Contour interpolation, grading and drainage plans, drive design, profiles and sections, computation of earth work. Application of surveying to landscape construction.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. PROCOPIO.

Prerequisites, Civil Engineering 25, Landscape Architecture 26.

52. (II) CONSTRUCTION DETAILS.—A series of problems in architectural garden features as walks, steps, walls, gates, pools, and small structures.

2 3-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. PROCOPIO.

Prerequisite, Landscape Architecture 51.

53. (I) GARDEN DESIGN.—Fundamental principles of composition with application to problems in the design of gardens and small home grounds.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. OTTO.

Prerequisites, Landscape Architecture 25 and 26 or permission of the instructor.

54. (II) GENERAL DESIGN.—A series of problems in the design of small properties, estates and parks. Members of this class will be required to take a two-day field trip to visit typical examples of design; approximate cost, \$8.00.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. OTTO.

Prerequisites, Landscape Architecture 51, 53, and concurrently 52.

76. (II) CIVIC ART.—A survey of the principles and applications of modern civic art, including city planning, regional planning and the design of various types of land areas.

3 2-hour laboratory periods.

Credit, 3.

Mr. OTTO.

Prerequisites, Landscape Architecture 51 and 52.

79. (I) CONSTRUCTION AND MAINTENANCE (1949-50).—A study of construction methods and the maintenance of estate, park, and recreation areas. Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. BLUNDELL.

80. (II) HISTORY AND LITERATURE OF LANDSCAPE ARCHITECTURE.—A review of the significant history and literature of landscape architecture and the allied fields of city planning, regional planning and highway improvement. Compilation of bibliographies on various phases of these fields.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. DURELL.

81. (I) 82. (II) ADVANCED DESIGN.—Class B Exchange Problems plus specialized study of landscape details and a summary of general design. Members of the class may be required to take a two-day field trip to visit typical examples of design; approximate cost, \$10.00.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. DURELL.

Prerequisites, Landscape Architecture 53 and 54.

83. (I) ARCHITECTURE (1950-51).—The history of architectural development, including styles of architecture and construction principles of value to the landscape architects when working with architectural problems. Given in alternate years.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. ROBERTSON.

84. (II) SKETCHING.—Drawing and sketching in various mediums from outdoor and indoor subjects.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 M. F.

Mr. ROBERTSON.

Horticulture

1. (I) PLANT PROPAGATION.—This course serves as an introduction to the field of horticulture, emphasizing the methods and principles involved in the propagation of horticultural plants.

3 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. THAYER, Mr. PROCOPIO.

26. (II) PLANT MATERIALS.—Detailed study of deciduous and evergreen trees, with special reference to their mature form and character, means of identification, natural associations, and uses of the various types of trees in landscape work. 1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. BLUNDELL.

51. (I) PLANT MATERIALS.—Detailed study of shrubs and woody vines, and their identification, with especial emphasis being given to their adaptability to the various landscape uses, methods of handling, and care.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. BLUNDELL.

52. (II) PLANTING DESIGN.—A study of the utilization of plant materials in combination as applied to the many conditions and demands of landscape work.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. BLUNDELL.

Prerequisites, Horticulture 26 and 51.

MATHEMATICS

Professor ANDERSON, Professor MACHMER, Assistant Professor BOUTELLE, Assistant Professor SCHOONMAKER, Assistant Professor ROSE, Mr. BEYTES, Mr. BUZZELL, Mr. SKILLINGS, Mr. RITGER, Mr. ALLEN.

5. (I) INTRODUCTORY ENGINEERING MATHEMATICS.—Trigonometry and algebra: a rapid basic review, theory of equations, simple determinants and the slide rule. Plane analytic geometry: the straight line, conic sections, selected higher plane curves, polar coordinates and parametric equations.

4 class hours. Credit, 4.
THE DEPARTMENT.

6. (II) INTRODUCTORY CALCULUS FOR ENGINEERS.—Differentiation, with applications, technique of integration.

4 class hours. Credit, 4.
THE DEPARTMENT.

Prerequisite, Mathematics 5.

7. (I) ALGEBRA AND TRIGONOMETRY.—For all freshmen, except majors in Engineering, who are required to take a full year of college mathematics. Fractions, quadratic equations,

exponents, logarithms, variation, determinants of the second and third orders, and plane trigonometry.

3 class hours.

Credit, 3.

THE DEPARTMENT.

8. (II) ALGEBRA.—This course is designed for the freshmen who do not plan to proceed to Calculus. Theory of equations, progressions, mensuration, number systems, and the elements of statistics and mathematics of investments.

3 class hours.

Credit, 3.

THE DEPARTMENT.

10. (II) ALGEBRA AND ANALYTIC GEOMETRY.—This course is designed for the freshmen who plan to take Calculus. Theory of equations, binomial theorem, determinants of higher order, and plane analytic geometry.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 7.

12. (II) FUNCTIONAL MATHEMATICS.—For freshmen who are not required to take a full year of college mathematics. Fractions, percentage, linear and quadratic equations with applications, exponents, logarithms, slide rule, proportion, graphs, statistics, progressions, and the elements of mathematics of investments.

3 class hours.

Credit, 3.

Mr. SCHOONMAKER, Mr. ALLEN.

27. (I) PLANE ANALYTIC GEOMETRY.—This course is designed for those who have had Mathematics 7 and 8 or their equivalents and who wish to prepare for later work in the calculus.

3 class hours.

Credit, 3.

Prerequisite, Mathematics 8.

THE DEPARTMENT.

29. (I) DIFFERENTIAL CALCULUS.—The basic ideas and methods of the differential calculus.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 10 or 27.

30. (II) INTEGRAL CALCULUS.—A continuation of Mathematics 29 into the field of the integral calculus, with special emphasis on application to problems.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 29.

31. (I) APPLIED CALCULUS FOR ENGINEERS.—Area, volume, length of curve, centroid, moment of inertia, liquid pressure, work, partial differentiation.

4 class hours.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 6.

32. (II) APPLIED CALCULUS FOR ENGINEERS.—Multiple integrals, infinite series, expansion of functions, hyperbolic functions, differential equations, elements of vector analysis. 4 class hours.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 31.

55. (I) MATHEMATICS OF FINANCE.—The mathematical principles of simple and compound interest, annuities, depreciation, valuation of bonds, insurance. The development and application of aids to computation in problems arising from financial transactions.

3 class hours.

Credit, 3.

10:00-10:50 Tu. S.; 11:00-11:50 Th.

Mr. BOUTELLE.

Prerequisite, Mathematics 7.

60. (II) SPHERICAL TRIGONOMETRY AND SOLID ANALYTIC GEOMETRY (1949-50).—The trigonometry of the sphere with application to terrestrial and celestial problems. This is followed by a study of higher plane curves and the analytic representation of points, lines, and surfaces in space. Given in alternate years.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 30.

62. (II) STATISTICS.—The fundamental mathematical principles of statistical analysis. The derivation of the basic formulas used, and the study and discussion of such topics as averages, dispersion, skewness, curve fitting, least squares, linear and curvilinear correlation, probability curve, probable error, sampling, reliability.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 10 or 27.

65. (I) THEORY OF EQUATIONS (1949-50).—An introduction to advanced algebra. A discussion of the conditions for and methods of solving algebraic and transcendental equations; ruler and compass constructions; systems of equations; determinants and matrices; symmetric functions; resultants; discriminants; invariants; the fundamental theorem of algebra. Given in alternate years.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 10 or 27.

66. (II) INTRODUCTION TO HIGHER GEOMETRY (1949-50).—A study of various methods employed in the modern treatment of the geometry of points, lines, and conics. Such topics as homogeneous point and line coordinates; infinite elements;

harmonic division; groups of transformations and their invariants; and the elements of projective and other geometrics, will be considered. Given in alternate years.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisite, Mathematics 10 or 27.

71. (I) VECTOR ANALYSIS (1950-51).—The algebra and calculus of vectors. Applications to physics and other fields will be considered. Given in alternate years.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisites, Mathematics 30; Physics 26.

72. (II) HISTORY OF MATHEMATICS (1948-49).—A study of the great agencies which have developed progress in mathematics. Desirable for students planning to teach mathematics. Given in alternate years.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. ANDERSEN.

Prerequisite, Mathematics 30.

91. (I) ADVANCED CALCULUS.—Series, expansion of functions, partial differentiation, envelopes, and multiple integrals.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 30.

92. (II) DIFFERENTIAL EQUATIONS.—

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 30.

94. (II) ADVANCED CALCULUS.—A continuation of Mathematics 91. Line and surface integrals; Taylor's expansion; Fournier series; calculus of variations; Elliptic, Gamma, and Beta functions; continuity theorems.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisite, Mathematics 91.

Astronomy and Meteorology

57. (I) METEOROLOGY.—A consideration of weather elements, air masses, frontal structures and storms, the construction and interpretation of weather maps and the general principles of weather forecasting.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. LANPHEAR.

58. (II) ASTRONOMY.—The course deals with a consideration of the atmosphere through which astronomical phenomena are observed; fundamental conceptions of the

celestial sphere, the solar system, stars, galaxies. The chief objective is to make the student alive to the beauty and order revealed in the sky.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. LANPHEAR.

MILITARY

Colonel WILLIAM N. TODD, JR., Cavalry; Lieutenant

Colonel FRANCES W. NYE, Air Corps;

Major HOWARD C. PARKER, Cavalry.

1. (I) 2. (II) Theoretical and practical instruction in leadership, drill and exercise of command, individual weapons and marksmanship, hygiene and first aid, maps and aerial photographs, military organization, and the National Defense Act, ROTC regulations.

3 scheduled hours.

First semester, Credit, 3.

Second semester, Credit, 2.

ARMY INSTRUCTORS.

25. (I) 26. (II) Theoretical and practical instruction in leadership, drill and exercise of command, physical development methods, maps, and aerial photographs, military administration, evolution of warfare, military law and boards.

3 scheduled hours.

Credit, 2.

ARMY INSTRUCTORS.

51. (I) 52. (II) Theoretical and practical instruction in leadership, drill and exercise of command, military leadership, psychology and personnel management, Geographical foundation of national power, and military law and boards; tactics and technique of cavalry or armored units for students in the armored cavalry unit; tactics and techniques of the Army Air Forces for students in the air corps unit.

5 scheduled hours.

Credit, 3.

ARMY INSTRUCTORS.

75. (I) 76. (II) Theoretical and practical instruction in leadership, drill and exercise of command, military teaching methods, military problems of the United States, psychological warfare, military mobilization and demobilization, command and staff operations; tactics and technique of cavalry or armored units for students in the armored cavalry unit; tactics and techniques of the Army Air Forces for students in the air corps unit.

5 scheduled hours.

Credit, 3.

ARMY INSTRUCTORS.

OLERICULTURE

Professor SNYDER, Assistant Professor TUTTLE, Mr. JOHNSON.

25. (I) GENERAL OLERICULTURE.—A study of the factors affecting the growth of plants which are essential to a basic

understanding of the cultural requirements of vegetable and other horticultural crops.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. SNYDER, Mr. JOHNSON.

51. (I) OLERICULTURE.—A critical study of the water and nutrient requirement of vegetable plants as applied to irrigation, soils and their preparation, manures, fertilizers, lime, green manures and crop residues.

3 class hours. Credit, 3.
Hours by arrangement. Mr. TUTTLE.

52. (II) OLERICULTURE.—A study of certain environmental factors which influence the culture of vegetables as applied to actual commercial practices.

3 class hours. Credit, 3.
Hours by arrangement. Mr. SNYDER.

73. (I) VEGETABLE MARKETING PRACTICES.—A consideration of the various factors, techniques, and methods in harvesting and preparing vegetables for market, including marketing centers, production areas, market and consumer preference, packing house facilities and equipment, and premarket storage. Trips to nearby growers and markets will be required at a cost of not over ten dollars.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. SNYDER.

Prerequisite, Agricultural Economics 55.

74. (II) MERCHANDISING OF PERISHABLES.—Discussion and demonstrations in this course will include the various techniques, practices, and methods that are used in selling and distributing horticultural commodities through both wholesale and retail outlets from the farm to the ultimate consumer. Trips to the Boston and New York markets may be elected by the student at a reasonable cost.

3 class hours. Credit, 3.
Mr. SNYDER.

75. (I) SYSTEMATIC OLERICULTURE.—A detailed study of variety identification; nomenclature and classification; history, variety improvement and seed sources; judging and exhibiting.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Hours by arrangement. Mr. SNYDER.

76. (II) GREENHOUSE CROPS AND PLANT GROWING (1948-49).—A study of the culture of greenhouse crops including cucumbers, tomatoes, lettuce, rhubarb, and mushrooms; the growing of seeding plants both under glass and in the open for local retail or wholesale business.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Hours by arrangement. Mr. SNYDER.

78. (II) COMMERCIAL OLERICULTURE.—A study of the problems in the commercial production of vegetables: general culture, fertilizers and manures, machinery, labor, harvesting, and marketing. One or two trips to important markets and truck growing sections are required. Twenty-five dollars will cover the cost of these trips.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. SNYDER.

81. (I) 82. (II) SEMINAR.—Advanced study of problems relating to vegetable production.

1 class hour.

Credit, 1.

Hours by arrangement.

THE DEPARTMENT.

PHILOSOPHY.

Professor GLICK.

61. (I) FUNDAMENTALS OF PHILOSOPHY.—A general approach to the study of philosophy both from the standpoint of method and content. This course attempts to provide a background for the understanding and evaluation of theories of education, religion, ethics, metaphysics, etc.

3 class hours.

Credit, 3.

8:00-8:50 or 11:00-11:50 M. W. F.

Mr. GLICK.

62. (II) HISTORY OF PHILOSOPHY.—A survey of the development of thought from the early Greeks to the recent past. Emphasis is placed upon the relation of philosophy to life as a whole with emphasis upon ethical, political, religious, educational, and metaphysical problems.

3 class hours.

Credit, 3.

8:00-8:50 or 11:00-11:50 M. W. F.

Mr. GLICK.

63. (I) LOGIC.—The primary function of logic as conceived in this course is to study the rules and techniques of thinking as applied to interpreting and evaluating the facts of science and the data of experience in general. A secondary aim is to study the structures of thought from the standpoint of clearness and ease of expression and the effectiveness of conviction. Logic is considered not only as a tool but as an art as well. It should possess something of the thrill of a game rather than the mere grind of a chore.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. GLICK.

64. (II) ETHICS.—A study of the fundamental ethical theories and practices both historical and contemporary. Ethical theories are studied in relation to different types of civilization and an attempt is made to evaluate the significance of each in our present civilization.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. GLICK.

PHYSICAL EDUCATION FOR MEN

Professor GORE, Professor RADCLIFFE, Professor ECK, Professor LORDEN, Associate Professor KAUFFMAN, Assistant Professor DERBY, Assistant Professor BRIGGS, Assistant Professor ROGERS, Mr. BALL, Mr. SALWAK, Mr. KOSAKOWSKI, Mr. MASI.

3. (I) 4. (II) PHYSICAL EDUCATION—PHYSICAL FITNESS ACTIVITY COURSE.—Planned progressively to help every man student meet reasonable minimum standards of physical fitness and through regularity and continuity of physical exercise to maintain good physical condition. The men are given physical fitness ratings and must meet minimum standards in use of obstacle course, the basic skills in several team sports, as well as learn to swim.

5 hours.

Credit, 1.

Mr. GORE, Mr. ROGERS, Mr. SALWAK and the DEPARTMENT.

5. (I) PHYSICAL EDUCATION SURVEY.—A survey of the health, physical education, and physical recreation courses which make up the physical education major. This course provides an introduction to the broad field of physical education.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. GORE, Mr. ROGERS, Mr. SALWAK and the DEPARTMENT.

33. (I) 34. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

5 hours.

Credit, 1.

THE DEPARTMENT.

63. (I) 64. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

5 hours.

Credit, 1.

THE DEPARTMENT.

83. (I) 84. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

5 hours.

Credit, 1.

THE DEPARTMENT.

22. (II) FIRST AID INSTRUCTORS.—The First Aid training course includes standard, advanced, and instructor courses, leading to qualification as American Red Cross First Aid Instructor with work in athletic training techniques and accident prevention.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. GORE.

41. (I) WINTER ACTIVITIES.—Winter ice and snow activities programs, including skiing, skating, conduct of winter

carnivals, winter sports safety; and the design, construction, and maintenance of winter sports facilities.

1 class hour; 1 2-hour laboratory period. Credit, 1.

9:00-9:50 Th.; laboratory hours by arrangement.

Mr. GORE, Mr. BRIGGS.

42. (II) AQUATICS.—The aquatic course gives training in water safety, swimming, diving, canoeing, boating, life-saving, and recreational swimming, leading to possible qualification as American Red Cross Water Safety instructor.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Hours by arrangement.

Mr. GORE, Mr. ROGERS, and the DEPARTMENT.

43. (I) OFFICIATING.—Technique and practice in officiating major sports.

1 class hour; 1 2-hour laboratory period. Credit, 1.

11:00-11:50 F.; laboratory hours by arrangement.

Mr. KAUFFMAN, Mr. BALL.

44. (II) TESTS AND MEASUREMENTS.—This course considers the status of measurement in physical education, an historical sketch, typical contributions in anthropometrics, strength tests, ability and achievement tests, cardiac functional tests, neuro-muscular control tests, and sport technique tests; and it includes the tools of measurement, indices, and the theory and practice of test administration.

2 class hours. Credit, 2.

11:00-11:50 M. F.

Mr. SALWAK.

45. (I) HISTORY AND PURPOSES OF PHYSICAL EDUCATION.—A brief study of the history of the development of the various systems of physical education and a study of the aims and ideals of present-day physical education.

2 class hours. Credit, 2.

11:00-11:50 M. W.

Mr. LORDEN.

51. (I) INTRODUCTORY COURSE FOR TEACHER-COACHES.—This course outlines the coaching of football, soccer, and basketball.

2 class hours; 1 2-hour laboratory period. Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. ECK, Mr. LORDEN, Mr. BRIGGS, Mr. BALL.

52. (II) INTRODUCTORY COURSE FOR TEACHER-COACHES.—Continuation of Course 51. This course outlines the coaching of baseball, track and field athletics, hockey, and athletic pedagogy.

2 class hours; 1 2-hour laboratory period. Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. LORDEN, Mr. DERBY, and the DEPARTMENT.

53. (I) PHYSICAL EDUCATION—ELEMENTARY SCHOOLS.—This course includes the objectives, organization, significance, and content of physical education in the grade schools. The course is correlated with the requirements of the State Department of Education.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 Tu. Th.; 1:00-2:50 M. Mr. DERBY.

54. (II) PHYSICAL EDUCATION—SPECIAL METHODS.—This course includes the objectives, significance, organization and content of physical education in junior and senior high school. The course is correlated with the requirements of the State Department of Education.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 Tu. Th.; 1:00-2:50 M. Mr. DERBY.

56. (II) ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION.—Considers the organization and administration of a department of physical education. Design, construction, maintenance, and service considerations of physical recreational areas are studied.

2 class hours. Credit, 2.
9:00-9:50 Tu. Th. Mr. HICKS.

57. (I) ORGANIZED CAMPING TECHNIQUES.—This course covers details of camping techniques from the three-fold angle of organized camp counselor, i.e., as a child counselor, as a general activities counselor, and as a specialty counselor.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. GORE.

58. (II) ORGANIZED CAMPING ADMINISTRATION.—This course includes the history of organized camping, minimum standards of health and safety, the development of camping philosophies, trends, and the camping industry.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. GORE.

59. (I) SCOUTING ELEMENTS AND PRINCIPLES.—A course in the elements and principles of scoutmastership, given in cooperation with the Scout Executive, Hampshire-Franklin Council, B.S.A.

1 class hour; 1 2-hour laboratory period. Credit, 2.
Hours by arrangement. Mr. GORE.

71. (I) 72. (II) SPECIAL PROBLEMS COURSES.—Presentation and discussion of research work in physical education, physical recreation, health and safety education, or athletics.

3 class hours. Credit, 3.
Hours by arrangement. Mr. GORE and the DEPARTMENT.

73. (I) RECREATION — ADMINISTRATION AND ORGANIZATION.—Administration and organization of recreational areas,

including playground layouts, equipment supplies, maintenance, leadership, training activities, conduct of programs, and problems of operations.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. GORE.

74. (II) RECREATION—RECREATION LAND USE.—Including types of recreational areas, recreational resources, recreational needs of the people, geography of recreation, competitors of recreational land use, economic aspects of federal, state, and local recreational systems.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. GORE.

76. (II) ANATOMY GENERAL.—A course in structural human anatomy.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Dr. RADCLIFFE.

78. (II) ANATOMY APPLIED—KINESIOLOGY.—A course aimed to give the anatomical application basal to a thorough understanding of the mechanical problems in apparatus, athletic, and corrective exercises.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Dr. RADCLIFFE.

Prerequisite, Physical Education 76.

PHYSICAL EDUCATION FOR WOMEN

Associate Professor TOTMAN, Miss HUBBARD, Miss WAGNER,
Mrs. HARMON.

7. (I) 8. (II) PHYSICAL EDUCATION.—Students are required to participate in one term of dancing, in one team sport, and to pass a safety test in swimming. Except for these requirements, all unrestricted students may select any activity which is offered. Fall season: field hockey, volleyball, soccer, archery, tennis, swimming. Winter season: basketball, volleyball, badminton, swimming, life saving (by permission), modern dance, square dance, calisthenics, posture training. Spring season: softball, soccer, archery, swimming, modern dance.

3 class hours.

Credit, 2.

THE DEPARTMENT.

27. (I) 28. (II) PHYSICAL EDUCATION.—The activities offered in Courses 7 and 8 are continued. In addition, advanced modern dance is offered in the fall season and water safety instruction in the winter season. Unrestricted students may select any activity which is offered.

3 class hours.

Credit, 2.

THE DEPARTMENT.

61. (I) 62. (II) PHYSICAL EDUCATION.—Participation in the activity classes for freshmen and sophomores, with the purpose of gaining further skill and developing physical fitness.

3 class hours.

Credit, 1.

THE DEPARTMENT.

81. (I) 82. (II) PHYSICAL EDUCATION.—Participation in activity courses for physical fitness with opportunity to learn refereeing in sports and to assist in teaching individual sports.

3 class hours.

Credit, 1.

THE DEPARTMENT.

PHYSICS

Professor POWERS, Associate Professor ALDERMAN, Associate Professor ROSS, Assistant Professor BURPO, Assistant Professor WANNLUND, Assistant Professor MATHIESON, Mr. CROOKER.

25. (I) MECHANICS, SOUND, AND HEAT.—This course is largely a study of the following and related topics; equilibrium of bodies; forms of energy and work; motion, fluids; surface tension; molecular phenomena; elasticity; wave-motion; sound; thermometry expansion; hygometry; transmission of heat; changes of state; radiation.

3 class hours; 1 2-hour laboratory period.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 8 or its equivalent.

26. (II) LIGHT AND ELECTRICITY.—Includes wave-theory of light; optical instruments; analysis of light; interference; polarization; magnetism; electrostatics; production and properties of electric currents; electrical appliances and machines; oscillatory circuits; vacuum tubes, and related topics.

3 class hours; 1 2-hour laboratory period.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Physics 25.

51. (I) 52. (II) MAGNETISM, ELECTRICITY, PHOTO-ELECTRICITY, THERMIONICS AND APPLICATIONS.—Course 51 deals largely with direct currents; Course 52 with alternating currents, applications of thermionics, and photo-electricity. These courses are planned to give the student a good training in theory and methods of measurement in the indicated subjects, which are useful in many fields of investigation. Modern methods are stressed and instruments of precision are used.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu., Th.; 10:00-11:50 Tu. or 1:00-2:50 Tu. or W.

Mr. POWERS.

Prerequisites, Physics 26 and Mathematics 29 for Course 51; Physics 51 for Course 52.

55. (I) 56. (II) MECHANICS.—Development of the fundamental concepts of dynamics with applications to particles and rigid bodies in translation and rotation. One laboratory period may be substituted for one class hour.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.; laboratory by arrangement.

Mr. Ross.

Prerequisites, Physics 26; Mathematics 30.

58. (II) ELEMENTS OF PHOTOGRAPHY.—Discussion of types of cameras, lenses, films, exposure, meters, processing of films and papers, enlarging, composition, color photography, photomicrography. A 2-hour laboratory period may be substituted for the class hour. Not offered in 1948-49.

3:00-3:50 W.

Mr. POWERS.

60. (II) SOUND AND ACOUSTICS.—A study of vibrations, vibrating bodies, coupled systems, sound structure, and acoustic properties. The work will include many applications of sound to technical and commercial fields.

3 class hours.

Credit, 3.

Mr. ALDERMAN.

Prerequisite, Physics 55 or its equivalent.

61. (I) 62. (II) HEAT AND THERMODYNAMICS (1949-50). A study of heat exchanges and energy changes due to heat in systems of matter. The subject material and experimental methods are useful in other branches of science. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; 2:00-3:50 Th.

Mr. ALDERMAN.

Prerequisites, Physics 26; Mathematics 29.

63. (I) 64. (II) OPTICS (1948-49).—An intermediate course in the theory of light. Work in geometrical and physical optics is done. Precision instruments are used in the laboratory. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; laboratory hours by arrangement.

Mr. ALDERMAN.

Prerequisites, Physics 26; Mathematics 29.

75. (I) 76. (II) ADVANCED EXPERIMENTAL WORK IN SELECTED TOPICS.—These courses are largely experimental and the subject matter is adapted to the needs of the individual student. The research viewpoint is emphasized. The class hour is used for a course in precision of measurements.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. POWERS.

Prerequisites, Physics 51-52 or 55-56 or 63-64; Mathematics 29, 30.

85. (I) 86. (II) MODERN PHYSICS (1949-50).—Typical subjects studied are theories of the atom, radiation, quantum theory; spectra, X-ray analysis, nuclear reactions. Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. POWERS.

Prerequisites, Physics 51, 62 and 64 or equivalent; Mathematics 29, 30.

95. (I) 96. (II) ELECTRONICS (1948-49).—Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. POWERS.

Prerequisites, Physics 51, 52; Mathematics 29, 30.

POMOLOGY

Professor FRENCH, Associate Professor ROBERTS, Assistant Professor O. G. ANDERSON, Mr. J. F. ANDERSON.

26. (II) SMALL FRUITS.—A study of the growing of raspberries, blackberries, strawberries, currants, blueberries, cranberries, and grapes, dealing with such questions as varieties, selecting a site for the plantation, soils, fertilizers, pruning, harvesting, and marketing.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. O. ANDERSON.

53. (I) GENERAL POMOLOGY.—A study of the most improved practices in tree fruit production, including orchard sites and soils, laying out and setting the orchard, the structure and growth of fruit plants; the bearing habits, pruning, fertilizers, pollination; harvesting and marketing the crop.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; 3:00-4:50 F.

Mr. ROBERTS, Mr. J. ANDERSON.

56. (II) SPRAYING.—This course is especially designed to familiarize the student with details of pest control in the orchard. It involves a study of (a) spraying and dusting machinery; (b) methods in the application of materials used in orchards, with the important considerations for spraying each fruit and for combating each orchard pest; (c) preparation for use of the common fungicides and insecticides.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 1:00-2:50 Tu.

Mr. ROBERTS.

57. (I) FRUIT JUDGING.—Practice in the identification, selection, and judging of fruit for exhibition purposes. From this class a team is selected to represent the University in Intercollegiate Fruit Judging Contests.

1 class hour.

Credit, 1.

Hours by arrangement.

Mr. O. ANDERSON.

75. (I) **SYSTEMATIC POMOLOGY (1950-51).**—A study of the more important kinds and varieties of fruits grown in the United States, their relationships and nomenclature. Particular emphasis is placed upon the identification, classification, and value of varieties including a study of the characters of the plant as well as the fruit. Given in alternate years.

1 class hour; 3 2-hour laboratory periods. Credit, 4.
9:00-9:50 Tu.; 1:00-2:50 M. W. F. Mr. O. ANDERSON.

77. (I) **COMMERCIAL POMOLOGY (1949-50).**—A critical consideration of the picking, grading, packing, storing, and marketing of fruits. This course also considers the leading American and foreign centers of fruit production as they affect our own fruit industry through competition here or abroad. A two-day market trip will be required at an approximate cost of ten dollars. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 W.

Mr. ROBERTS, Mr. J. ANDERSON.

81. (I) 82. (II) **ADVANCED POMOLOGY.**—A consideration of the scientific principles governing the growth and behavior of fruit-bearing plants. Special attention is given to the more important research work in the field of pomology.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Hours by arrangement. Mr. FRENCH.
Prerequisite, Pomology 53.

83. (I) 84. (II) **SEMINAR.**—Advanced study of problems relating to fruit production.

1 class hour. Credit, 1.
Hours by arrangement. THE DEPARTMENT.

Plant Breeding

51. (I) **PLANT GENETICS.**—A study of the principles of genetics with emphasis on their application to plants.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. FRENCH.

52. (II) **PLANT BREEDING METHODS.**—An advanced study of genetic topics peculiar to plants, also the methods and problems of the plant breeder. Laboratory work in genetic analysis and the breeding of plants.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. W.; 10:00-11:50 F. Mr. FRENCH.
Prerequisite, Plant Breeding 51.

81. (I) 82. (II) **SPECIAL PROBLEMS IN PLANT BREEDING.**
—Qualified seniors may carry on advanced study on special topics or undertake such original investigations as time and available material will permit.

Hours by arrangement. Credit, 2.
Mr. FRENCH.

Prerequisite, Plant Breeding 52.

POULTRY HUSBANDRY

Professor JEFFREY, Professor SANCTUARY, Assistant Professor BANTA, Assistant Professor VONDELL.

25. (I) GENERAL POULTRY.—Not open to students majoring in poultry husbandry. A general course giving an introduction to the breeds of poultry, the principles and practice of breeding, incubation, and poultry nutrition, brooding and rearing, houses and equipment, management practices, marketing poultry products, and the business of poultry keeping. 2 class hours; 1 2-hour laboratory period. Credit, 3.

9:00-9:50 M. F.; 10:00-11:50 or 1:00-2:50 or 3:00-4:50 Tu.

Mr. JEFFREY.

52. (II) INCUBATION AND BROODING.—This course is based upon the actual operation of incubators and brooders. Each year a research project is planned and data obtained concerning the effects of various incubator adjustments upon malpositions and maldevelopment of embryos and the percentage of hatch. Studies of temperature gradients, chick behavior and development are made in brooding with various types of equipment. Analysis is made of common and unusual field problems.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 Tu.; 3:00-4:50 Th.; other hours by arrangement.

Mr. SANCTUARY.

53. (I) POULTRY JUDGING.—Physiological and anatomical characters are used in production judging. The American Standard of Perfection is employed in a study of the more popular breeds and varieties, and for exhibition judging. Judging teams competing in the Eastern Intercollegiate Contest are trained in this course.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-8:50 Tu.; 1:00-2:50 W. F.

Mr. BANTA.

55. (I) POULTRY HOUSING AND SANITATION.—In this course are considered the biological factors related to the proper physical environment necessary for growth, health, and reproduction. Various systems of ventilation and methods of insulation are studied and demonstrated by models. Humidity, temperature, and condensation studies are made at the poultry plant with varying adjustments of ventilation devices. A study is made of modern equipment. Sanitation from the standpoint of disease prevention practices is also considered.

1 class hour; 1 2-hour laboratory period. Credit, 2.
11:00-11:50 Tu.; 3:00-4:50 Th.

Mr. SANCTUARY.

56. (II) POULTRY NUTRITION.—A study of the scientific principles of nutrition, classification and identification of

feedstuffs, formulation and calculation of rations for specific purposes. A class trip may be arranged.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th.; 1:00-2:50 W.

Mr. BANTA.

75. (I) **MARKETING POULTRY PRODUCTS.**—A study of the preparation and grading methods of eggs and poultry products to meet the requirements of the northeastern markets. The laboratories are designed to cover the fields of modern dressing, processing and packaging of poultry; as well as grading, candling and quality studies of eggs. A one-half day class trip to Springfield markets in December is required. Estimated cost, two dollars.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

10:00-10:50 Tu.; 3:00-4:50 W.

Mr. VONDELL.

76. (II) **TURKEY PRODUCTION.**—This course includes the production of ducks and geese but most of the time is given to the turkey industry; its importance, breeds, breeding, incubation, brooding, feeding, finishing, marketing, etc.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

1:00-1:50 M.; 1:00-2:50 W.

Mr. VONDELL.

77. (I) **POULTRY BREEDING.**—The improvement of poultry by selection is developed through a study of the principles of heredity. The inheritance of morphological and physiological characters including plumage color, egg production, meat production, hatchability, egg traits, and disease resistance.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. W.; 3:00-4:50 F.

Mr. JEFFREY.

Prerequisite, Zoology I.

78. (II) **SEMINAR AND FARM MANAGEMENT.**—A combination seminar and lecture course designed to give the student a comprehensive view of all phases of the poultry industry. A field trip covering approximately three days will be arranged. Students may elect an additional problem credit.

3 class hours; 1 2-hour laboratory period may be elected.

Credit, 3, 4.

10:00-10:50 M. W. F.

Mr. JEFFREY.

PSYCHOLOGY

Professor NEET, Assistant Professor FELDMAN, Assistant Professor VALLANCE, Mr. GOSS, Miss PHILLIPS, Mr. MICHELSON.

26. (I) and (II) **GENERAL PSYCHOLOGY.**—This is an introductory course dealing with the basic principles and applications of psychology with regard to the understanding and control of behavior. Topics considered include the nature

and development of behavior, motivation, emotion, learning, problems of adjustment, thinking, intelligence, aptitudes, and personality.

3 class hours.

Credit, 3.

THE DEPARTMENT.

28. (II) **ADVANCED GENERAL PSYCHOLOGY.**—A detailed consideration of some of the major problems of psychology. Topics considered include motivation, emotion, neutral relationships, learning, perception, and sensory processes. Stress is placed on methodology and on theoretical implications.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

51. (I) **EXPERIMENTAL PSYCHOLOGY.**—This course is designed to give an understanding of the problems, methods, and data of experimental psychology. One of the basic functions of the course is to acquaint the student with the scientific method as applied to experimental studies of behavior.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; 1:00-2:50 Tu. W. or Th.

Mr. NEET.

Prerequisite, Psychology 26.

55. (I) **EDUCATIONAL PSYCHOLOGY.**—A study of psychological facts and principles fundamental to education, teaching, and personal relationships between teacher and pupil. Topics considered in relation to school situations are: physical and mental growth, intelligence, motivation, emotions, learning, transfer of training, and mental hygiene of teacher and pupil.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. VALLANCE.

Prerequisite, Psychology 26.

61. (I) **SOCIAL PSYCHOLOGY.**—A study of human behavior as influenced by interaction with others. Major topics considered are: the socialization of motives, the nature and sources of personality, social attitudes and their measurement, mechanisms of social interaction, behavior in crowd and audience, language and communicative behavior, custom and conforming behavior, prejudice, and general theories of social behavior.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. VALLANCE.

Prerequisite, Psychology 26.

63. (I) **PHYSIOLOGICAL PSYCHOLOGY.**—A study of the relationships between the individual's behavior and his physiological processes. Emphasis will be placed on sensory and motor phenomena, drives, emotional behavior, and learning.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. FELDMAN.

Prerequisites, Psychology 26; Zoology 35.

72. (II) **ADVANCED EXPERIMENTAL PSYCHOLOGY.**—The literature, techniques, and apparatus of experimental psychology are considered in detail, and selected projects are carried out individually by the members of the class.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th.

Mr. NEET.

Prerequisite, Psychology 51.

75. (I) **STATISTICS IN PSYCHOLOGY.**—The application of statistical procedures to the analysis of psychological data and to problems of measurement in psychology and related fields.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

2:00-2:50 M. F.; 2:00-3:50 W.

Mr. Goss.

Prerequisites, Psychology 26; Agricultural Economics 79 or Mathematics 62.

81. (I) 82. (II) **PSYCHOLOGICAL TESTS.**—Different varieties of psychological tests are studied. The first semester considers group tests of intelligence; aptitude, interest, personality, and clinical tests. The second semester is devoted to a consideration of individual and performance tests of intelligence and to the nature and theories of intelligence. Practice will be given in administering, scoring, interpreting, and evaluating tests. Either semester may be elected independently.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 Tu.; laboratory hours by arrangement.

Miss PHILLIPS.

Prerequisite, Psychology 26.

83. (I) **ABNORMAL PSYCHOLOGY AND MENTAL HYGIENE.**—A study of the causes, prevention, symptoms, and treatment of behavior abnormalities. Special attention is given to the following: sensory and motor disorders, speech problems, memory losses and other disorders of association, emotional extremes, feeble-mindedness, the neuroses and psychoses.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

86. (II) **INDUSTRIAL PSYCHOLOGY.**—The course aims to give understanding of psychological principles and methods in business and industrial situations. Topics considered include: employee selection and training, motivation and morale, labor-management relations, working conditions and fatigue, accident prevention, and advertising and selling.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. VALLANCE.

Prerequisite, Psychology 26.

88. (II) **PSYCHOLOGY OF GUIDANCE.**—A study of the psychological principles and techniques necessary in guidance. Practice is given in organizing and evaluating relevant data in the analysis of illustrative cases.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th.; laboratory hours by arrangement.

Miss PHILLIPS.

Prerequisite, Psychology 26.

90. (II) **CONTEMPORARY PSYCHOLOGIES.**—A logical, historical, and systematic analysis of contemporary psychological theories, including structuralism, functionalism, purposivism, Gestalt and organismic psychologies, orthodox psychoanalysis and its derivatives, and the behaviorisms from Thorndike and Watson to the contemporary scene.

3 class hours.

Credit, 3.

2:00-2:50 M. W. F.

Mr. Goss.

Prerequisite, Psychology 26.

92. (II) **CLINICAL PSYCHOLOGY.**—A study of the techniques and methods involved in the diagnosis and treatment of behavior disorders. Clinical testing, counselling, and psychotherapy are given consideration.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. FELDMAN, Mr. MICHELSON.

Prerequisite, Psychology 84 and consent of the instructor.

94. (II) **CHILD AND ADOLESCENT PSYCHOLOGY.**—This course aims to develop an understanding of the behavior of the child from birth to adolescence. Psychological aspects of the following topics are considered: original nature, maturation, mental development, emotions, play, social behavior, language, speech defects, learning, moral behavior, personality and mental hygiene. Nursery school observation and practice.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

95. (I) 96. (II) **PROBLEMS IN PSYCHOLOGY.**—For qualified seniors. The student will be allowed to do independent work and study on special problems or in certain fields of psychological interest. By arrangement with the members of the department.

Credit, 1.

THE DEPARTMENT.

ROMANCE LANGUAGES

Professor FRAKER, Professor GODING, Assistant Professor
CLARKE, Assistant Professor FERRIGNO, Miss ROGERS,
Mr. CESTRE.

French

1. (I) 2. (II) **ELEMENTARY FRENCH.**—For those who have had no previous French or whose preparation is insufficient for more advanced courses. Intensive drill for rapid reading, writing, speaking and understanding. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

4 class hours.

Credit, 3.

Mr. GODING, Mr. CESTRE.

3. (I) 4. (II) **INTERMEDIATE FRENCH.**—Primarily a reading course with stress on both exact translation and rapid reading for comprehension. Grammar review and oral practice. Recommended for those who want only a reading knowledge of French.

4 class hours.

Credit, 3.

Mr. GODING.

Prerequisites, French 1 and 2, or 2 years of high school French.

5. (I) 6. (II) **ADVANCED INTERMEDIATE FRENCH.**—Readings from representative masterpieces of French literature. Composition, grammar review, intensive oral practice.

4 class hours.

Credit, 3.

Miss CLARKE.

Prerequisites, French 3 and 4, or 3 years of high school French, or permission of the Department.

9. (I) 10. (II) **ORAL PRACTICE.**—Not open to freshmen except in conjunction with another course in French. Intensive oral practice, vocabulary study, grammar essentials for fluent speech. Recommended for those who desire a reasonably good command of the spoken language.

4 class hours.

Credit, 3.

Mr. CESTRE.

Prerequisites, French 3 and 4 or equivalent or permission of the instructor.

15. (I) 16. (II) **SURVEY OF FRENCH LITERATURE.**—Readings from representative masterpieces of French literature. Review of grammar. Composition, outside reading. Conducted in French except for one section conducted in English.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, French 3 and 4 and permission of the Department.

Advanced Courses

Prerequisites, French 15 and 16, or French 5 and 6 and permission of the instructor. Since most of the advanced courses are conducted in French, the student should have a reasonable oral command of the language before electing these courses. For this purpose the student is advised to take French 9 and 10, or spend one year in the French House.

29. (I) 30. (II) FRENCH LITERATURE OF THE SEVENTEENTH CENTURY (1949-50).—A survey of the Classic period, with readings from representative works. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

31. (I) 32. (II) FRENCH LITERATURE OF THE NINETEENTH CENTURY (1948-49).—A detailed study of the more important authors and movements. Given in alternate years.

3 class hours.

Credit, 3.
Mr. GODING.

51. (I) FRENCH LITERATURE OF THE EIGHTEENTH CENTURY (1950-51).—*Rosseau: The Encyclopedists*. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

52. (II) VOLTAIRE (1948-49).—A study of the Eighteenth Century through the life and works of Voltaire. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

53. (I) 54. (II) FRENCH LITERATURE OF THE TWENTIETH CENTURY.

3 class hours.

Credit, 3.
Miss CLARKE.

75. (I) COURS DE STYLE.—A study of syntax and idioms at an advanced level. The student is taught how to express himself clearly and logically in living French.

4 class hours.

Credit, 3.
Mr. CESTRE.

79. (I) FRENCH CIVILIZATION.—A study of those elements which lie back of the cultural contribution of France to the world civilization. Subjects studied will include arts, sciences, school systems, the press, the family, social classes, influences of history and geogaphy. The assigned readings will be drawn from contemporary French Literature.

4 class hours.

Credit, 3.
Mr. GODING.

80. (II) **TEACHER TRAINING COURSE.**—Practice teaching, methods, outside readings, observations, reports.

4 class hours.

Credit, 3.
Mr. GODING.

82. (II) **ADVANCED GRAMMAR AND COMPOSITION.**—Phonetics. Recommended for majors who intend to teach French.

4 class hours.

Credit, 3.
Mr. GODING.

Italian

51. (I) 52. (II) **ELEMENTARY ITALIAN.**—An introductory course for those who have had no previous Italian or whose preparation is insufficient for more advanced work. Training in grammar, composition, pronunciation, with special emphasis on reading.

4 class hours.

Credit, 3.
Mr. FERRIGNO.

75. (I) 76. (II) **INTERMEDIATE ITALIAN.**—Primarily a reading course with considerable attention to review of grammar, and speech.

4 class hours.

Credit, 3.
Mr. FERRIGNO.

Latin

51. (I) 52. (II) **LATIN.**—A course in elementary Latin. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours.

Hours by arrangement.

Credit, 3.
Miss ROGERS.

55. (I) 56. (II) **LATIN.**—A college survey of classical Latin literature: epic (Virgil), lyric (Catullus and Horace), comedy (Plautus), oratory (Cicero), and philosophy (Lucretius). The list may be varied according to the needs of particular classes.

3 class hours.

Hours by arrangement.

Credit, 3.
Miss ROGERS.

Prerequisite, two years of Latin in high school or Latin 51, 52.

Spanish

1. (I) 2. (II) **ELEMENTARY SPANISH.**—Grammar, exercises in composition and conversation, reading of selected short stories. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours; 4th hour optional.

Credit, 3.
Mr. FRAKER, Mr. FERRIGNO, Miss ROGERS.

7. (I) 8. (II) **INTERMEDIATE SPANISH**.—Readings from modern authors; grammar review.

3 class hours; 4th hour optional.

Credit, 3.

Mr. FERRIGNO, Miss ROGERS.

Prerequisites, Spanish 1 and 2 or three years of high school Spanish.

29. (I) **THE ROMANTIC PERIOD (1948-49)**.—Readings from representative authors; written and oral composition. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. FRAKER.

Prerequisites, Spanish 7 and 8.

30. (II) **THE MODERNISTS (1948-49)**.—Dario, Nervo and their contemporaries; composition and conversation. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. FRAKER.

Prerequisite, Spanish 29.

73. (I) 74. (II) **THE GOLDEN AGE (1949-50)**.—Readings from Cervantes, Lope de Vega, Calderon, Garcilaso and others. Composition and conversation. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. FRAKER.

Prerequisites, Spanish 7 and 8.

SOCIOLOGY

Professor KORSON, Mr. DRIVER, Mr. MANFREDI.

28. (I) and (II) **INTRODUCTION TO SOCIOLOGY**.—An outline of the social order, and of the individual considered as a member of his various groups.

3 class hours.

Credit, 3.

THE DEPARTMENT.

51. (I) **URBAN SOCIOLOGY**.—A comparative study of modern social conditions, and methods of adjustment, with special reference to city environment. Characteristics of the population, urban ecology, and problems of adjustment in the fields of housing, health, education, and recreation.

3 class hours.

Credit, 3.

2:00-2:50 Tu. Th., third hour by arrangement.

Mr. MANFREDI.

Prerequisite, Sociology 28.

52. (II) **RURAL SOCIOLOGY**.—A study of rural society from the standpoint of its population, institutions, standards of living, and their relation to urban society.

3 class hours.

Credit, 3.

Mr. KORSON.

Prerequisite, Sociology 28.

53. (I) AN INTRODUCTORY STUDY OF CULTURAL ANTHROPOLOGY.—A non-technical sociological study of man in pre-literate societies.

3 class hours.

Credit, 3.

Mr. MANFREDI.

Prerequisite, Sociology 28.

54. (II) AMERICAN RACE RELATIONS.—The social, economic, and political aspects of racial problems in the United States, with particular reference to the Negro and major ethnic groups. A rabbi, minister, and priest are invited to address the class, and visits are made to the respective churches.

3 class hours.

Credit, 3.

Mr. KORSON.

Prerequisite, Sociology 28.

57. (I) THE FAMILY.—The history and development of the customs of courtship and marriage from primitive society to the American family. The basic causes of changes and trends of the family are considered. The folkways and mores of marriage in other contemporary societies are also studied.

3 class hours.

Credit, 3.

Mr. KORSON.

Prerequisite, Sociology 28.

61. (I) POPULATION PROBLEMS.—An analytical study of population trends and problems of the world; the origin, composition, growth, migration, and urbanization of the American population. A consideration of population pressure as a cause of migratory movements.

3 class hours.

Credit, 3.

Mr. DRIVER.

Prerequisite, Sociology 28.

75. (I) SOCIAL PROBLEMS.—A study of abuses affecting the home, recreation, business, industry, family, welfare, public health government, mental disease, and crime. The charitable and correctional institutions of Massachusetts as agencies of reform. Visits to Belchertown State Schools, Northampton State Hospital, and Northampton Superior Court are arranged, and specialists in their fields will be invited as speakers.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. DRIVER.

Prerequisite, Sociology 28.

76. (II) INTRODUCTION TO SOCIAL WELFARE.—For senior majors and others who qualify. Contemporary problems of social concern: causes of poverty; methods of caring for adult and child dependents and defectives. A consideration of public and private agency administration and techniques, and an

examination of federal, state, and local community programs.
3 class hours.

Credit, 3.

Mr. DRIVER.

Prerequisites, Sociology 28, 51, 75.

78. (II) CRIMINOLOGY.—A study of the nature of crimes and the factors underlying criminal behavior. Attention is also given to the machinery of justice in criminal behavior: the law, the courts, police enforcement, penal and correctional institutions.

3 class hours.

Credit, 3.

Mr. DRIVER.

Prerequisite, Sociology 75.

79. (I) 80. (II) SEMINAR.—Admission by permission of instructor. A study of the methods of research employed by sociologists. Students, under direction of the instructor, analyze and organize such sociological material as they gather through their own research. Projects must be approved in advance by the instructor.

Credit, 3.

Hours by arrangement.

Mr. KORSON.

82. (II) SOCIOLOGICAL THEORY.—An examination of the contributions of European and American writers who have concerned themselves with theories of the origin, growth, and development of human social organization.

3 class hours.

Credit, 3.

Mr. MANFREDI.

Prerequisite, Sociology 53.

SPEECH

Assistant Professor NIEDECK, Assistant Professor ROBERTSON,
Mr. ZAITZ, and the DEPARTMENT OF ENGLISH.

29. (I) 30. (II) PUBLIC SPEAKING.—This course is designed to give the student instruction and opportunity in oral self-expression. It includes both public speaking and literary interpretation. Scheduled under English 25, 26.

1 class hour.

Credit, 1.

THE DEPARTMENT.

89. (I) DRAMATIC PRODUCTION.—This course offers instruction and practice in casting, directing, acting, make-up, lighting, and scenic design and construction.

3 2-hour laboratory periods.

Credit, 3.

Mr. NIEDECK, Mr. ROBERTSON.

91. (I) FORMAL DISCUSSION.—Most of the semester is devoted to formal discussion: its organization and presentation. Students are given the opportunity to lead and to participate in discussions of current problems.

3 class hours.

Credit, 3.

Mr. ZAITZ.

92. (II) EXTEMPORE SPEECH.—The theory and practice of public speaking for business and professional purposes.
3 class hours.

Credit, 3.
Mr. NIEDECK.

VETERINARY SCIENCE

Professor LENTZ, Associate Professor SMITH.

51. (I) VETERINARY HYGIENE.—The essentials of the health of animals and specific diseases of animals are considered.

3 class hours.
8:00-8:50 M. W. F.

Credit, 3.
Mr. LENTZ.

75. (I) COMPARATIVE VETERINARY ANATOMY.—The structure of the horse is studied and the structures of other farm animals are compared with it.

3 class hours.
10:00-10:50 M. W. F.

Credit, 3.
Mr. SMITH.

76. (II) GENERAL VETERINARY PATHOLOGY.—A study of fundamental, general pathological conditions; inflammation, fever, etc., and application of principles of etiology, pathogenesis, and prophylaxis of communicable and non-communicable diseases of domesticated animals.

3 class hours.
11:00-11:50 M. W. F.

Credit, 3.
Mr. SMITH.

88. (II) AVIAN PATHOLOGY.—Consists of lectures devoted to principles of pathology, with specific application to avian diseases. Etiology, pathogenesis, and prophylaxis will be emphasized.

3 class hours.
Hours by arrangement.

Credit, 3.
Mr. LENTZ.

ZOOLOGY

Professor WOODSIDE, Professor BISHOP, Assistant Professor TRAVER, Assistant Professor BARTLETT, Assistant Professor ROLLASON, Assistant Professor SNEDECOR, Mr. ANDREWS, Miss TILTON, Mr. BOND, Mr. BERMAN, Mr. RESNICK.

1. (I) and (II) INTRODUCTORY ZOOLOGY.—(Constitutes one semester of the freshman course in biology). This course provides an introduction to the principles of biology, with special reference to the zoological aspects. The structure and activities of a representative vertebrate animal, the frog, are considered in detail and the knowledge thus gained is utilized in a comprehensive survey of the major groups of the animal kingdom. Brief introductions are given to the principles of classification, nutrition, structure and functions of protoplasm, genetics, heredity, development, and evolution.

2 class hours; 2 2-hour laboratory periods. Credit, 3.
 9:00-9:50 Tu. Th. or 11:00-11:50 M. W.; 1:00-2:50 M. F. or
 Tu. Th. or 3:00-4:50 M. F. or 10:00-11:50 F.; 3:00-4:50 W. or
 3:00-4:50 Tu.; 1:00-2:50 W. or 10:00-11:50 M. W. or 3:00-4:50
 Th.; 11:00-11:50 S.

Mr. WOODSIDE, Mr. ANDREWS, Miss TILTON, Mr. BERMAN.

25. (I) SURVEY OF THE ANIMAL KINGDOM.—The lectures deal briefly with the classification, morphology, distribution, ecology, life history, abundance, inter-relationships and economic importance of each of the phyla of the animal kingdom, with emphasis on those phyla not discussed at length in the introductory course. The laboratory work is a continuation and expansion of the work done in the introductory course, and therefore the notebook prepared in that course is required for reference in Zoology 25. Whenever possible, living representatives of each of the phyla studied will be used.

2 class hours; 1 2-hour laboratory period. Credit, 3.
 10:00-10:50 M. F.; 8:00-9:50 W. or 1:00-2:50 Tu. or Th.
 Prerequisite, Zoology 1.

Mr. BARTLETT, Mr. ANDREWS.

35. (I) and (II) VERTEBRATE PHYSIOLOGY.—An introductory course which will include consideration of circulation, respiration, digestion, metabolism, excretion, chemical and nervous coordination, muscular activity, and reproduction. The laboratory work will acquaint the student with some of the equipment and methods used in physiological studies, with emphasis on the experimental approach to the laboratory exercises.

2 class hours; 1 3-hour laboratory period. Credit, 3.
 Mr. RESNICK, Mr. SNEDECOR.

50. (II) HISTOLOGY OF THE VERTEBRATES.—A study of the types of tissues found in the body of vertebrate animals, and of the organs in which these tissues occur. Tissues and organs of mammals are emphasized. A knowledge of comparative anatomy is advised.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
 9:00-9:50 Tu.; 1:00-2:50 Tu. Th. Miss TRAVER.
 Prerequisite, Zoology 1.

51. (I) and (II) MICROTECHNIQUE OF ANIMAL TISSUES.—The course comprises (1) a consideration of the principles and methods of microtechnique as applied to animal tissues, and (2) a series of practical exercises in the preparation of animal tissues for microscopic examination. Registration is limited to 12 students per semester. Consult instructor for section assignments.

2 2-hour laboratory periods. Credit, 2.
 10:00-11:50 Tu.; 1:00-2:50 W. Mr. ROLLASON.
 Prerequisite, Zoology 1.

65. (I) 66. (II) **COMPARATIVE VERTEBRATE ANATOMY.**—This course is an attempt to give the student a thorough understanding of the anatomy of the principal organ systems of vertebrate animals. Animals studied in the laboratory are: protochordates, an elasmobranch fish; a caudate amphibian; a bird; and a mammal. Demonstration specimens of the other classes will be available for comparison of each of the organ systems studied. The course is arranged to run throughout the year, and is required of zoology majors. It is especially recommended for premedical students and students of historical geology and wildlife management. No credit will be given for a single semester of work.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 Th.; 3:00-4:50 M. F. or Tu. Th. or 1:00-4:50 W.

Mr. BARTLETT, Mr. BOND.

Prerequisite, Zoology 1.

69. (I) **ANIMAL PARASITOLOGY.**—Important protozoan and helminthic parasites of man and domestic animals. Emphasis is placed upon morphology, physiological activities, classification and phylogeny of the parasite; life cycles, vectors, and modes of transmission; host-parasite relationships, and other fundamental principles of parasitism as a way of life.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Miss TRAVER.

Prerequisite, Zoology 1.

70. (II) **ADVANCED INVERTEBRATE ZOOLOGY.**—A survey of the invertebrate animals from evolutionary and phylogenetic aspects. Morphology, modes of nutrition and reproduction, interrelationships with other animals, and distribution in time and space, are considered, as well as classification. Marine, freshwater and land faunas representative of each major group are studied.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Miss TRAVER.

Prerequisite, Zoology 25 or equivalent.

75. (I) 76. (II) **VERTEBRATE EMBRYOLOGY.**—The study of vertebrate embryology generally assumes a knowledge of comparative vertebrate anatomy. A thorough study is made of the development of representative animals, special emphasis being placed on the amphibian, bird, and mammal. General embryological principles are stressed throughout, and appropriate introductions are given to the hormones of reproduction and to experimental embryology. The work is arranged to run through the year and is required of students specializing in zoology and especially recommended for premedical students.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
11:00-11:50 Th.; 1:00-2:50 M. F. or 3:00-4:50 M. F.

Mr. WOODSIDE, Mr. ROLLASON.

Prerequisite, Zoology 1.

80. (II) ORNITHOLOGY.—Lectures consider the history of ornithology, classification, evolution, anatomy, physiology, nesting habits, flight, migration, distribution, and abundance of the birds of the world. Laboratory work consists of three parts: a study of the characteristics for field identification of the birds of New England; a study of the anatomy of a typical bird, the pigeon. The course is required of students in wildlife management and recreational leadership, and recommended for zoology majors. A knowledge of comparative anatomy will be helpful. Course limited to twenty students.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

8:00-8:50 Th.; 3:00-4:50 M. F.

Mr. BARTLETT.

Prerequisite, Zoology 1.

81. (I) VERTEBRATE ZOOLOGY.—An introduction to the vertebrates, their classification and ecology, with particular emphasis on the fishes. Field trips for the study of local fauna will be included as a part of the laboratory exercises. Course limited to eighteen students.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 1:00-2:50 Tu. Th.

Mr. ANDREWS, Mr. BARTLETT.

Prerequisite, Zoology 1.

83. (I) COMPARATIVE PHYSIOLOGY.—A course designed to familiarize students with physiological principles and adaptations to the environment of animals throughout the invertebrate phyla. In the laboratory the experimental method will be developed involving general procedures and individual problems.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

Mr. BISHOP.

Prerequisites, Zoology 1, 35.

84. (II) GENERAL CELLULAR PHYSIOLOGY.—The properties and processes common to all organisms, including protoplasmic organization, permeability, metabolism, movement, bioelectricity, and reproduction.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

Mr. BISHOP, Mr. RESNICK.

Prerequisites, one year biology; organic chemistry.

85. (I) CLASSES OF ARTHROPODS OTHER THAN INSECTS.—Arthropods are studied from the phylogenetic standpoint, with special reference to their relationship to the origin and evolution of insects.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 Tu.; 1:00-2:50 Tu. Th.

Mr. HANSON.

86. (II) FISHERY BIOLOGY.—Theory in the practice of regulating freshwater fisheries; the physical and biological

conditions of the environment and their influence on fish populations.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. ANDREWS.

Prerequisite, Zoology 81 and permission of instructor.

87. (I) ENDOCRINOLOGY. — Emphasis will be directed toward the importance of the hormones in their control over normal functions (growth, metabolism, reproduction, etc.) in a variety of animals.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. SNEDECOR.

Prerequisite, Zoology 1.

91. (I) 92. (II) SPECIAL PROBLEMS IN ZOOLOGY.—Qualified graduate students and seniors who have met departmental requirements for specialization in the field of zoology may arrange for work on a special problem in zoology.

Credit, 3.

THE DEPARTMENT.

Invertebrate Zoology, Marine Biological Laboratory,
Woods Hole, Massachusetts. Credit, 3.

DEGREES CONFERRED 1948

June 7, 1948

RECIPIENTS OF HONORARY DEGREES

HERBERT KENDALL HAYES, St. Paul, Minnesota—*Doctor of Science*
HARLAN PAGE KELSEY, Boxford, Massachusetts—*Doctor of Science*
LOUIS MARTIN LYONS, Reading, Massachusetts—*Doctor of Humane Letters*
JULIAN STILES EATON, Miami, Florida—*Doctor of Laws*
JOSEPH WARREN BARTLETT, Boston, Massachusetts—*Doctor of Laws*
October 16, 1948
JAMES BRYANT CONANT, Cambridge, Massachusetts—*Doctor of Laws*

DOCTOR OF PHILOSOPHY (Ph.D.)

SHERMAN GILBERT DAVIS . . .	Worcester
ROBERT EARLE EVANS . . .	Evanston, Ill.
ARTHUR MILTON KAPLAN . . .	Chelsea
CORNELIUS CRAWFORD LEWIS . . .	Baltimore, Md.
VICTOR MARCUS LEWIS . . .	Coogee, New S. Wales
RICARDO MILLARES SOTRES . . .	Coyoacan, Mexico
ROY EARL MORSE . . .	Amherst
MOHAMMED SAYEED QURAISHI . . .	Jodhpur, Pakistan
COURTNEY EMERY WALKER . . .	Fallis, Oklahoma
ANNE WILLIAMS WERTZ . . .	Amherst

MASTER OF SCIENCE (M.S.)

IRA WERNER ALBRECHT . . .	Westfield
DAVID WERNER ANDERSON, JR. . .	Worcester
PHILIP BRIGHAM ANDERSON . . .	South Hadley
JOHN PETRIE BALL . . .	Worcester
FERNAND E. BARTLETT . . .	Rutland, Vt.
GARLAND BOOKER BASS . . .	Reidsville, N. C.
ADELE BLOSSOM BITCOVER . . .	Amherst
LOIS ELIZABETH BROW . . .	Cranston, R. I.
STANLEY WILLIAM BUBRISKI . . .	Housatonic
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Zoology	113, 259

GIFTS AND BEQUESTS

For the information of those who may wish to make a gift or a bequest to this University, the following suggestion is made as to a suitable form which may be used.

There are a number of worth-while activities of the University which are handicapped by lack of funds and for which small endowments would make possible a greater measure of service to our students and to the Commonwealth. The religious work on the Campus is an example. This is now carried on in a very limited way by current private contributions. Further information concerning this and other activities in similar need will be gladly furnished by the President.

SUGGESTED FORM

"I give and bequeath to the Trustees of the University of Massachusetts, at Amherst, Massachusetts, the sum ofdollars."

(1) (Unrestricted)

"To be used for the benefit of the University of Massachusetts in such manner as the Trustees thereof may direct."

or (2) (Permanent Fund: income unrestricted)

"to constitute an endowment fund to be known as the.....
.....Fund, such fund to be kept invested by the Trustees of the University of Massachusetts and the annual income used for the benefit of the College in such manner as the Trustees thereof may direct."

or (3) (Specific Purposes)

"to be used for the following purposes,"

(Here specify in detail the purposes.)

UNIVERSITY OF MASSACHUSETTS ENROLLMENT

October 1948

UNDERGRADUATE COLLEGE AT AMHERST

Class....	1949		1950		1951		1952		Total		
SCHOOL	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
Liberal Arts	121	75	236	41	57	55	59	87	474	258	732
Science	115	38	191	33	73	36	74	48	453	155	608
Engineering	21	0	295	0	35	0	54	0	405	0	405
Horticulture	47	5	114	2	42	6	29	3	232	16	248
Business											
Administration	19	0	140	1	36	5	30	7	225	13	238
Agriculture	34	0	64	3	50	1	39	0	187	4	191
Home Economics ..	0	26	0	31	0	42	0	36	0	135	135
Division of Physical											
Education	6	0	22	0	9	0	5	0	42	0	42
Specials									5	8	13
TOTAL	364	144	1062	111	302	145	290	181	2023	589	2612

GRADUATE SCHOOL (October 1948)

Men	Women	Total
173	48	221

STOCKBRIDGE SCHOOL (October 1948)

1949		1950		Total
Men	Women	Men	Women	
176	3	229	4	412

SUMMARY (October 1948)

Undergraduate College at Amherst	2612
Undergraduate College at Devens	813
Stockbridge School of Agriculture	412
Graduate School	221
TOTAL	4058

Office of Publications, October, 1948



BEE PUBLISHING COMPANY
LAWRENCE, MASSACHUSETTS

*Other University of Massachusetts
Catalogues:*

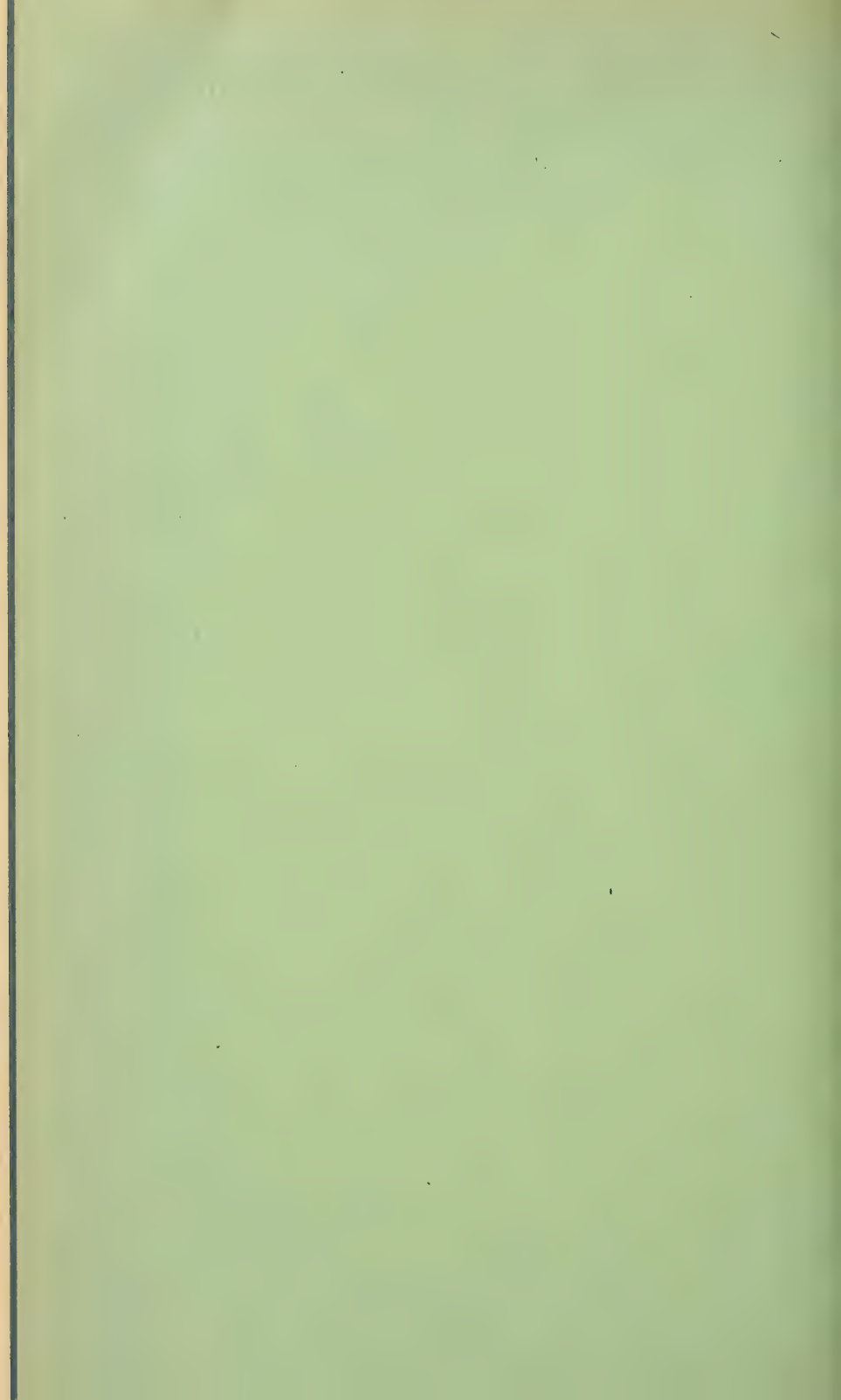
- Summer School Catalogue
- Graduate School Catalogue
- Stockbridge School Catalogue

THE UNIVERSITY OF MASSACHUSETTS

BULLETIN



GRADUATE SCHOOL
1949-1950



Bulletin

THE UNIVERSITY OF MASSACHUSETTS

Graduate School Number

1949 - 1950



The Graduate School Catalogue for the sessions of 1949-50 is part of the Eighty-sixth Annual Report of The University of Massachusetts and in conjunction with the general catalogue of The University it constitutes Part II of Public Document 31 (Sec. 8, Chapter 75, of the General Laws of Massachusetts).

AMHERST, MASSACHUSETTS

Volume XLI

March, 1949

Number 3

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as second-class matter.

CALENDAR

1949

June 10, Friday and June 11, Saturday . . .	Entrance Examinations
June 13, Monday	Registration for Summer Session
June 14, Tuesday, 8:00 A.M.	Summer Session Opens
July 4, Monday	Independence Day. No College Exercises
July 23, Saturday, 12:00 M.	End of first six-week Summer Session
July 25, Monday, 8:00 A.M.	Summer Session Opens for Second Half
Sept. 3, Saturday, 12:00 M.	End of Summer Session
Sept. 19, Monday, 9:00 A.M.	Registration of Freshman and Senior Students
Sept. 20, Tuesday, 9:00 A.M.	Registration of Sophomores and Junior Students
Sept. 21, Wednesday, 2:00 P.M.	Opening Convocation
Sept. 22, Thursday, 8:00 A.M.	Classes Begin
October 12, Wednesday	Columbus Day. No College Exercises
November 11, Friday	Armistice Day. No College Exercises
November 23, Wednesday, 12:00 M. to November 28, Monday, 8:00 A.M.	Thanksgiving Recess
December 17, Saturday, 12:00 M. to January 3, 1950, Tuesday, 8:00 A.M.	Christmas Recess

1950

January 3, Tuesday, 8:00 A.M.	Classes Resume
January 19, Thursday, 5:00 P.M.	Classes Stop
January 20, Friday, 9:00 A.M.	Registration of Freshman and Senior Students
January 21, Saturday, 9:00 A.M.	Registration of Sophomores and Junior Students
January 23, Monday to February 1, Wednesday	Final Examinations
February 1, Wednesday	First Semester Ends
February 6, Monday, 8:00 A.M.	Second Semester Begins
February 22, Wednesday	Washington's Birthday. No College Exercises
April 1, Saturday, 12:00 M. to April 10, Monday, 8:00 A.M.	Spring Recess
April 19, Wednesday,	Patriot's Day. No College Exercises
May 23, Tuesday, 12:00 M.	Classes Stop
May 24, Wednesday to June 1, Thursday, 5:00 P.M.	Final Examinations
May 30, Tuesday	Memorial Day. No College Exercises
June 2, Friday to June 5, Monday	Commencement

THE TRUSTEES OF THE UNIVERSITY

Organization of 1949

MEMBERS OF THE BOARD

	TERM EXPIRES
ALDEN C. BRETT of Belmont	1950
ERNEST HOFTYZER of Wellesley	1950
MRS. ELIZABETH L. McNAMARA of Cambridge	1951
LEONARD CARMICHAEL of Medford	1951
MRS. JOSEPH S. LEACH of Walpole	1952
RALPH F. TABER of West Newton	1952
CLIFFORD C. HUBBARD of Mansfield	1953
JOHN M. DEELY of Lee	1953
HARRY D. BROWN of Billerica	1954
JOHN W. HAIGIS of Greenfield	1954
JOSEPH W. BARTLETT of Boston	1955
PHILIP W. WHITMORE of Sunderland	1955
WILLIAM A. ORTON of Northampton	1956
WILLIAM M. CASHIN of Milton	1956

MEMBERS EX OFFICIO

His Excellency PAUL A. DEVER, *Governor of the Commonwealth.*
 RALPH A. VAN METER, *President of the University.*
 JOHN J. DESMOND, JR., *Commissioner of Education.*
 JOHN CHANDLER, *Commissioner of Agriculture.*

OFFICERS OF THE TRUSTEES

His Excellency PAUL A. DEVER, *Governor of the Commonwealth, President.*
 JOSEPH W. BARTLETT of Boston, *Chairman.*
 JAMES W. BURKE of Amherst, *Secretary.*
 ROBERT D. HAWLEY of Amherst, *Treasurer.*

The Graduate School Staff

RALPH A. VAN METER, *President of the University.*
 FRED J. SIEVERS, *Director of the Graduate School.*
 Deans of the Schools.
 Heads of all Divisions.
 Heads of Departments in which Graduate Courses are offered.
 Professors, Associate Professors and Assistant Professors in charge of courses offered for graduate credit.

The Graduate School Advisory Committee

FRED J. SIEVERS, *Director of the Graduate School, Chairman.*
 LEON A. BRADLEY, *Head of the Department of Bacteriology and Public Health.*
 CARL R. FELLERS, *Head of the Department of Food Technology.*
 RICHARD W. FESSENDEN, *Professor of Inorganic Chemistry.*
 HELEN S. MITCHELL, *Dean of School of Home Economics.*
 ALBERT W. PURVIS, *Professor of Education.*
 HARVEY L. SWEETMAN, *Professor of Entomology.*

GENERAL INFORMATION

HISTORY

Graduate courses leading to the degree of doctor of science were offered in botany under President Clark and in chemistry under Professor Goessmann as early as 1876. No candidate, however, completed the requirements for that degree. It was not until 1892, under President Henry H. Goodell, that courses leading to the degree of master of science were offered. This degree was first conferred in June, 1896, on two candidates. Graduate courses leading to the degree of doctor of philosophy were first offered in 1897, with chemistry, botany and entomology as major and minor subjects. The first degree was conferred on one candidate in June, 1902.

In the early years the graduate work was conducted under the direct administration of the President in conjunction with the four year courses. The demand for advanced work increased, however, and in June, 1908, the trustees made the Graduate School a separate unit in the College and appointed a director. Beginning with July 1, 1930, the responsibilities of the Graduate School were combined with those of the Agricultural Experiment Station. This arrangement is proving mutually beneficial by making the staff and equipment of the Experiment Station available for service in the Graduate School, and in turn providing an opportunity to utilize the services of graduate students in organized research projects.

LOCATION AND LANDS

The University of Massachusetts is located in Amherst, a town of about six thousand people, overlooking one of the most picturesque sections of the Connecticut Valley. From the standpoint of teaching material in the field of science and agriculture, the location is ideal. Amherst is eighty-eight miles from Boston, fifty miles from Worcester, twenty-five miles from Springfield, eighteen miles from Greenfield, and eight miles from Northampton. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. The University is well provided with modern buildings and equipment, description of which may be found in the general catalogue.

PURPOSE AND SCOPE OF THE GRADUATE SCHOOL

The purpose of the Graduate School is to provide qualified students with proper guidance in the methods of advanced study and research. Courses leading to the degree of doctor of philosophy, master of science, and master of landscape architecture are available. Students who desire advanced courses but who do not wish to become candidates for an advanced degree are also admitted.

DOCTOR OF PHILOSOPHY

Candidates for the degree of doctor of philosophy are required to pursue study in three subjects, one of which is designated as the major, and the others as minors. An original thesis is considered a part of the major subject. The degree is conferred upon graduate students who have met the following requirements:—

1. The devotion of at least three years to three subjects of study and research.
2. The earning of not less than ninety credits of which not less than sixty shall be in the chief or major subject, and not less than fifteen in each of two minor subjects.
3. The preparation of a satisfactory thesis.
4. The passing of final examinations, written and oral, in both the major and minor subjects.

5. The presentation of evidence of a working knowledge of both French and German.
6. The passing of a public oral examination.
7. The payment of all fees and expenses.

It should be emphasized that the requirements for this degree are not computed primarily in terms of time and credits but that the degree is conferred only upon such students as have reached satisfactory attainment in some special branch of learning.

MASTER OF SCIENCE

Candidates for the degree of master of science are required to pursue study in two subjects, one of which is designated as major and the other as minor. When desirable, and approved by the director, the minor may be made up of subjects from more than one department.

The degree is conferred upon graduate students who have met the following requirements:—

1. The devotion of at least one year to two subjects of study and research.
2. The earning of not less than thirty credits, of which approximately two thirds shall be in the major subject.
3. The preparation of a satisfactory thesis in the major subject or the solution of a specific problem at the option of the major adviser.
4. The passing of final examinations, written and oral, in the major subject.
5. The payment of all fees and expenses.

MASTER OF LANDSCAPE ARCHITECTURE

Candidates for the degree of master of landscape architecture are expected to conform to the established courses as specified by the department of landscape architecture. The degree is conferred upon graduate students who have met the following requirements:—

1. Work covering at least three years, of which a minimum of one and one-half years must be devoted to study in residence, and a minimum of one year spent in practice, specific requirements concerning the nature of such practice to be laid down by the department.
2. Submission of a complete written report on the work done in practice.
3. Written approval from the employer as to the quality of service during the period devoted to practice.
4. Preparation of a satisfactory thesis.
5. Presentation of convincing evidence of genuine aptitude for some branch of landscape architecture as design, construction or management.
6. Completion of final examinations.
7. Payment of all fees and expenses.

The degree of bachelor of landscape architecture may be earned upon the completion of one year of specialized work in that field. (See page 44.)

ADMISSION

Admission to the Graduate School will be granted:

1. To graduates of the University of Massachusetts.
 2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this University.
- The University of Massachusetts, together with a number of other universities, recognizes the Graduate Record Examination as prepared and administered by the Carnegie Foundation for the Advancement of Teaching as particularly valuable evidence of qualifications, and recommends this examination to students

who may feel the need for supplementing their undergraduate records for purposes of satisfying admission requirements. For further information with regard to this examination and places where it may be taken, students should write to the Carnegie Foundation for the Advancement of Teaching, 522 Fifth Avenue, New York 18, New York.

Applications for admission should be accompanied by a transcript of the student's undergraduate record.

ENROLLMENT FOR A DEGREE

Admission to the Graduate School is not to be interpreted as implying admission to candidacy for an advanced degree in any given department. Such candidacy is subject to specific requirements as laid down by the several departments, and the student must secure the approval of the head of the department in which he desires to major before he can become a candidate for a degree in that subject.

STUDY IN RESIDENCE

It is understood that, in general, graduate credit will be granted only for courses pursued in residence; that is, in regularly approved courses conducted by a qualified member of the staff of the University of Massachusetts.

Under certain conditions, and then only by special arrangement with the director of the Graduate School, credit earned elsewhere will be accepted to apply toward the requirements for the degree.

NON-DEGREE ENROLLMENT

Graduate work may be taken by students who are not candidates for a degree. Such enrollment permits the special privilege of a wider range in the selection of courses. The courses selected should, however, bear an appropriate relation to one another and be within the confines of the preparation of the student. A statement of the subjects chosen must, in each case, be submitted to the director of the Graduate School for approval.

PREREQUISITES

In case an applicant has not completed in his undergraduate work as much of the subject he desires to select for his major study as is required of graduates of the University of Massachusetts, he will be expected to pursue such undergraduate courses in that subject as the head of the department may consider necessary, without credit toward the advanced degree.

In the case of minor subjects for advanced degrees, credit begins to accrue from the point where the previous training of the applicant ended, whether it be graduate or undergraduate in its rating at this University—subject, however, to such limitations as may be fixed by the department concerned.

GENERAL STATEMENT

A working knowledge of French and German is considered important for successful graduate work in practically all the major lines, and is required for the doctor of philosophy degree. Students not offering modern language for admission will be given an opportunity to acquire proficiency in same along with their graduate work.

The courses listed under departmental statements in the succeeding page constitute the principal and characteristic work of the graduate student.

The University reserves the right to make changes in the requirements for degrees without notice.

COURSES OFFERED

DOCTOR OF PHILOSOPHY—MAJOR SUBJECTS

Courses available as major subjects for the degree of doctor of philosophy:

Agronomy	Economics
Bacteriology	Entomology
Botany	Food Science
Chemistry	Food Technology

MASTER OF SCIENCE—MAJOR SUBJECTS

Courses available as major subjects for the degree of master of science:

Agricultural Economics and Farm Management	Food Technology
Agronomy	Geology and Mineralogy
Animal Husbandry	Home Economics
Bacteriology	Olericulture
Botany	Physical Education for Men
Chemistry	Pomology
Dairy Industry	Poultry Science
Economics	Psychology
Education	Public Health
Entomology	Romance Languages
Floriculture	Wildlife Management
	Zoology

MASTER OF LANDSCAPE ARCHITECTURE

Courses available for the degree of master of landscape architecture:

Landscape Architecture

MINOR SUBJECTS

Courses available as minor subjects:

Agricultural Economics and Farm Management	German
Agronomy	History
Animal Husbandry	Home Economics
Bacteriology	Landscape Architecture
Biological Field Studies	Mathematics
Botany	Olericulture
Chemistry	Philosophy
Dairy Industry	Physical Education for Men
Economics	Physics
Education	Pomology
Engineering	Poultry Science
English	Psychology
Entomology	Public Health
Floriculture	Romance Languages
Food Technology	Sociology
Forestry	Veterinary Science
Geology and Mineralogy	Wildlife Management
	Zoology

THESES

A thesis must be on a topic in the field of the candidate's major subject, and must indicate that its writer possesses the ability and imagination necessary to do independent constructive thinking. The following rules should be adhered to in the preparation and presentation of a thesis:—

1. The objective of a thesis should be an attempt to make real contribution to knowledge and practice. When completed it should be of a quality worthy of publication as a contribution from the department concerned.

2. The thesis, in its completed form, will be judged largely upon the ability of the author to review literature and reach definite deductions; to formulate a problem, plan a method of attack, and work out a solution; and to summarize his material and draw conclusions. Scholastic attainment in writing and presenting the results of the study will also be an important factor in the evaluation. No thesis markedly poor in its English will be accepted.

3. After the student, in consultation with his major adviser (head of the department in which the student selects his major), decides upon a thesis subject he is required to submit three copies of an outline to the director of the Graduate School. The director, with this as a basis, selects from the graduate staff a thesis committee to whom the outline is submitted for approval. This committee will, thereafter, have direct charge of all matters pertaining to said thesis, and it is recommended that the student use the advice available from this source in the progress of his research. The thesis must have the approval of this committee before arrangements are made for the final examination for the degree.

4. Three complete, bound copies of the thesis, including drawings and any other accessories, are required by the Graduate School office in order that the files in the director's office, the library and the department in which the thesis was prepared may be supplied.

5. If the thesis is printed, whether in periodical or book form, the fact that it is a thesis submitted for an advanced degree at the University of Massachusetts shall be explicitly stated in the title itself or as a footnote on the front page. Such modifications as may be deemed necessary for publication shall have the approval of the director.

6. Because of the time required to give adequate consideration to the research conducted by the student, it is highly desirable that theses be submitted to the committee, in the case of doctors' theses, not later than March 15, and in the case of masters' theses, not later than May 15 of the academic year in which the degrees are to be conferred. The theses in their final form shall be deposited with the director by June 1.

7. If typewritten, whether designed for publication or to remain in the typewritten form, the size of the sheet, the arrangement of the title page, the general structure of the thesis, the character of the paper, and the binding must conform to definite standards.

A. *Size of sheet.* Size of sheet must measure $8\frac{1}{2}$ x 11 inches.

B. *Form of title page.* The title page should be distributed as artistically as possible and must be arranged in this order:

- a. Subject.
- b. Name of author.
- c. "Thesis submitted for degree of—."
- d. "University of Massachusetts, Amherst."
- e. Date.

C. Following the title page, the arrangement may take such form, variable of course with the subject matter, as is illustrated below:—

- a. An analytical outline of thesis.

- b. An introductory statement in which the purposes of the author are set forth.
 - c. The body of the thesis composed of literature critically reviewed and deductions made, formulation of method of attack or procedure, and results secured. (All literature reviews and any work done by others should be so separated that no question can be raised as to which portion of the thesis represents the original investigation. It should be clearly kept in mind that *compilation* is not considered original investigation.)
 - d. Summary and conclusions.
 - e. Bibliography. (This should have the approval of the chairman of the thesis committee before final arrangement.)
 - f. Acknowledgments.
 - g. Statements of approval signed by members of the thesis committee.
- D. *Paper*. See sample in the University store.
- E. *Binding*. See sample of binding in director's office.
- S. All theses are the property of the University and subject to the will of the director of the Graduate School.

FINAL EXAMINATIONS

For the degree of doctor of philosophy final examinations on the minors are given upon the completion of the subjects. In the major subjects, a written examination, if successfully passed, is followed by an oral examination in the presence of the graduate staff.

For the degree of master of science, or master of landscape architecture, a final examination in the major subject, which may be written or oral, or both, is given by the department concerned.

ESTIMATE OF EXPENSES

A charge of \$50 per semester, payable in advance, which covers tuition, laboratory and student health fees, is imposed on students who are residents of Massachusetts. For residents of other states or foreign countries, this charge is \$110 per semester. In cases where students carry less than a full schedule of courses, a special tuition rate is provided. For purposes of definition, all students claiming residence in the State shall at time of admission provide the treasurer's office with an official statement from their town or city clerk as evidence.

Board should not be in excess of \$9 per week. Rooms for graduate students are not available in the dormitories, but can be rented in private homes at from \$20 to \$25 per month. The costs of books and incidentals should not exceed \$150 per year.

LOTTA SCHOLARSHIPS

The Lotta Crabtree Agricultural Fund provides for a limited number of scholarships as an award to worthy graduates of the University of Massachusetts interested in continuing their education in agriculture, horticulture, or physical and biological sciences. These scholarships pay \$500 per annum and application for consideration should be made to the director of the Graduate School.

TEACHING FELLOWSHIPS

Through a fund set aside for that purpose, the University offers a number of teaching fellowships. The value of these is limited to \$800 per year, and appointments absolve students from tuition and are especially suited to those who desire

to gain teaching experience and to make themselves at least partly self-supporting while continuing their education. It should be recognized, however, that, in cases where students render this part-time service in return for the financial assistance extended, the residence time requirement for the degree in question is necessarily longer. Application for appointment to these fellowships should be made to the director of the Graduate School or to the head of the department in which the candidate's major interest lies.

RESEARCH FELLOWSHIPS

The Agricultural Experiment Station in its program of investigation frequently finds it desirable to utilize the services of graduate students qualified to do certain types of technical work required in connection with its several research projects. Funds are available for this purpose and qualified students may be elected to such fellowships. Not infrequently this arrangement affords an opportunity for the student to satisfy his thesis requirement by completing some unit of work within a larger project organized in the research program of the Experiment Station.

In recent years industrial concerns have been rather anxious to have certain investigations undertaken for them by the Experiment Station. For this service they are willing to lend financial support, and in deserving cases it has proved very desirable to accept and utilize these funds for fellowship purposes. At present several fellowships are supported on this basis. These are proving very satisfactory from the standpoint both of the student and the industry supporting the investigation.

GRADUATE COURSES DURING THE SUMMER

The University offers opportunities to pursue graduate courses during the summer in connection with the Summer School. While provision may be made for special study with several departments during the summer period, the scheduled courses are offered primarily for teachers who seek advanced work in education and closely related subjects for purposes of better preparing themselves for more effective service in the teaching profession. Details regarding courses offered, facilities for study, environment, etc., may be found in the Summer School catalogue, a copy of which is available upon request to the director of Short Courses.

DESCRIPTION OF COURSES

Agricultural Economics and Farm Management

A. H. LINDSEY in Charge

COURSES FOR MAJOR OR MINOR CREDIT

126. ECONOMICS OF AGRICULTURAL PRODUCTION.	Credit, 3.
	Professor BARRETT
155. MARKETING FARM PRODUCTS.	Credit, 3.
156. FUNDAMENTALS OF COOPERATION.	Credit, 3.
157. AGRICULTURAL CREDIT AND LAND APPRAISAL.	Credit, 3.
	Professor LINDSEY.
171. AGRICULTURAL ECONOMIC THEORY.	Credit, 3.
	Professor LINDSEY.
176. FARM OPERATION AND ADVANCED FARM ORGANIZATION.	Credit, 4.
	Professor BARRETT.
178. PRINCIPLES OF LAND ECONOMICS.	Credit, 3.
	Professor LINDSEY.
179. PRINCIPLES AND METHODS OF STATISTICS.	Credit, 3.
	Professor LINDSEY.
180. ADVANCED STATISTICS.	Credit, 3.
	Professor LINDSEY.
182. ADVANCED FARM OPERATION.	Credit, 3.
	Professor BARRETT.
184. RESEARCH METHODS AND PROCEDURE.	Credit, 3.
186. INVESTIGATIONS OF PROBLEMS IN AGRICULTURAL ECONOMICS AND FARM MANAGEMENT.	Credit, 1-3.
	THE DEPARTMENT.
190. SEMINAR.	Each Semester, Credit, 1-3.
	THE DEPARTMENT.
200. THESIS.	Credit, 10.
	THE DEPARTMENT.

Agronomy

DALE H. SIELING in Charge

Graduate study in Agronomy is arranged to furnish training in Soils and Crops with an opportunity to specialize in either. The courses offered are designed to give the student thorough training in the application of the basic sciences to this applied science. Graduate courses in Chemistry, Botany, Bacteriology, Biology, Genetics and Geology will be required as may be needed to give a training balance and to complete the credit requirements.

COURSES FOR MAJOR OR MINOR CREDIT

105. SOIL GENESIS.—Factors influencing soil formation and development will be discussed. The science of soil classification and its application will be studied. Credit, 3.

First Semester 1948-1949.

111. FIELD CROP PRODUCTION.—A survey course which includes the regional distribution, the cultural requirements, production, and the utilization of the principal field crops grown in the U. S. Credit, 3.

First Semester 1948-1949.

116. **FORAGE CROPS.**—A survey course which includes the regional distribution, the cultural requirements and the utilization of the principal forage crops grown in the U. S.

Second Semester 1948-1949.

Credit, 3.

126. **CROP IMPROVEMENT** (applied Genetics).

Second Semester 1948-1949.

Credit, 3.

135. **NUTRITION OF FIELD CROPS.**—The study of plants in respect to their environment induced by man or by nature; such as water, air, temperature, supply of nutrients, injurious factors, and soil conditions.

First Semester 1949-1950.

Credit, 3.

137. **TURF CULTURE.**—A problem pertinent to the immediate need of growers of fine turf will be assigned. The organization and conduct of the work will be regularly supervised. If warranted, the results obtained will be published in a trade or scientific journal.

First Semester 1949-1950.

Credit, 3.

139. **HAY AND PASTURE CROPS OF THE NORTHEAST.**—The cultural requirements and utilization of the legumes used for hay and pasture purposes in the Northeast.

First Semester 1949-1950.

Credit, 2.

145. **SOIL PHYSICS AND TECHNOLOGY.**—The application of physical techniques to soils research will be discussed. The effect of heat, light, particle size and charge and air and water movement in soils on the properties and characteristics of soils will be studied.

First Semester 1949-1950.

Credit, 3.

160. **FERTILIZATION AND SOIL CONSERVATION.**—The purpose of this course will be to study the methods for proper soil management as they affect the conservation of our soil resources. The role of fertilization, crop adaptation, land use, and soil erosion control methods, will be stressed as applied to the general field of soil conservation.

Second Semester 1949-1950.

Credit, 3.

163. **CHEMISTRY OF THE SOIL.**—The chemistry of soil formation, soil acidity, nutrient element availability, ionic exchange and fixation, biological soils reactions, soil-plant-microorganism relationships, and of organic matter of the soil will be discussed. The laboratory work will consist of physical, analytical and biochemical investigations of soils and important soil constituents.

1948-1949.

Credit, 3 each semester.

164. **EXPERIMENTAL METHODS IN AGRONOMY.**—The purpose of this course is to set forth some of the concepts regarding the application of statistics to the analysis and interpretation of data obtained in agricultural research. Such points as choice of field, design of experiments, effect of competition, interpretation of results, and other special factors that need to be considered in well-planned experiments are discussed.

Second Semester 1949-1950.

Credit, 3.

185. **FERTILIZER TECHNOLOGY.**—The chemical and physical problems of fertilizer formulation and manufacture will be discussed. Sources of raw materials, improvement of manufacturing methods, and objective in the industry will be studied.

Second Semester 1949-1950.

Credit, 3.

190. **SEMINAR.**

Credit, 1 each semester.

200. **THESIS.**—For students taking major work in Agronomy. Credit, 10-30.

COURSES FOR MINOR CREDIT ONLY

51. **FIELD CROPS.**—A study of the field crops of the U. S. which will include their uses and improvement, with their soil and climatic requirements. Emphasis will be given to the best farm practices of the northeastern states as to rotation, liming, seeding methods, tillage, disease and insect control, and methods of harvesting and storage. As an individual problem, each student must make a detailed plan of crop production for the actual conditions of some New England farm. Credit, 3.

52. **SOIL UTILIZATION.**—The relationship of climate and native vegetation to the broader aspects of soil formation is described. Man's use of land resources is connected to show how the agricultural backgrounds of the settlers have been active in soil use and abuse. Soil erosion control and its significance to permanent agriculture is considered. Credit, 3.

57. **SOIL FORMATION.**—The first part of this course considers those physical, chemical, biological, climatic and geological factors involved in soil formation. The relationship of these factors to the kinds of soils formed in the United States is discussed. Credit, 3.

78. **FERTILIZERS.**—The primary purpose of this course is to relate soils and fertilizers to plant growth. Studies are made of fertilizer practices in the United States and Europe. In the early part of the course consideration is given to the history of fertilizer development with special emphasis upon early discoveries and causes of failure in early research. Later in the course studies are made of factors which relate fertilizers and soils to plant growth. Fertilizer formulation, technology and practice are considered in detail in the laboratory phase of this course. Credit, 3.

79. **SOIL PHYSICS.**—For seniors specializing in Agronomy. The factors in soil which control tilth and energy relationships and the laws of physics which govern these factors are discussed. This includes heat, light, color, particle size and charge, water and gas movement, energy relationships and other physical factors effecting changes in the soil. The laboratory is used to familiarize the students with various methods used in measuring these important physical factors. Credit, 3.

Animal Husbandry

VICTOR A. RICE in Charge

COURSES FOR MAJOR OR MINOR CREDIT

110. **ADVANCED NUTRITION OF FARM ANIMALS.**—A course dealing with the chemistry and physiology of the digestion, absorption and utilization of feeds. The major portion of the course consists of a study of the literature concerning the phases of nutrition that are of the greatest interest and value to the individual student. Credit, 5.

120. **ADVANCED ANIMAL BREEDING.**—This course deals with the inheritance of specific characters and qualities in farm animals as revealed by experiment or through the regularly compiled records of the various Purebreed Associations. The student will make a thorough review and analysis of available data in the field of his choice. Credit, 5.

130. **PROBLEMS IN LIVESTOCK PRODUCTION.**—This course will deal with some specific problem in feeding, management, or production of some specific livestock product such as milk, wool, meat, etc. Assistance will be given in outlining the problem and setting up the experimental procedure and the student will be held responsible for collecting and analyzing the data. Credit, 5.

200. **THESIS.**

Credit, 10.

COURSES FOR MINOR CREDIT ONLY

51. **NUTRITION OF FARM ANIMALS.**—This course will present the fundamental principles of animal nutrition, together with the identification, composition, properties and uses of the common feed stuffs. The application of these basic principles in calculating balanced rations for all classes of livestock will be stressed, followed by practical feeding problems assigned outside the classroom. Feeding practices in use with College livestock will be analyzed and demonstrated. Credit, 3.

53. **ELEMENTS OF MEAT PACKING.**—The lectures will discuss the development of the modern packing industry, the history of meat inspection, the principles of meat preservation and the opportunities in this field. Laboratories include the classification of cattle, calves, sheep and swine into proper market classes and grades and slaughtering and dressing operations with animals provided by the college farm. Wholesale and retail cuts are prepared and various by-products are manufactured and sold. A one-day trip through the packing houses of Boston is a requirement of this course. Credit, 3.

56. **GENERAL LIVESTOCK PRODUCTION.**—Studies in the historical and economic development, present status and probable future trends of general livestock production in the United States and especially in New England. Consideration will be given to types of production, systems of management, and methods of marketing. Credit, 4.

73. **ADVANCED MEAT STUDIES.**—For Animal Husbandry and Food Technology seniors and graduate students. This course deals with the basic techniques in preparing, preserving, and utilizing meat products. Credit, 2.

75. **ANIMAL BREEDING.**—This course is planned to acquaint the student with the facts of reproductive physiology, with the facts and theories of modern genetics, and to show how such knowledge may be utilized through genetic analyses, selection and systems of breeding for the creation of more beautiful and more efficient animal types. Credit, 4.

78. **DAIRY CATTLE PRODUCTION.**—This is an intensive course covering all phases of dairy cattle and milk production. It affords an opportunity to seek the solution to the economic, nutritional, genetic, and managerial problems concerned in successful dairying. Credit, 4.

81. **ANIMAL HUSBANDRY SEMINAR.**

Credit, 1.

Bacteriology and Public Health

LEON A. BRADLEY in Charge

Bacteriology

COURSES FOR MAJOR OR MINOR CREDIT

100. **HISTORY OF BACTERIOLOGY.**—Studies in the development of bacteriology from the late seventeenth century to the present time, especially planned to show the developments of bacteriology in relation to agriculture, public health, the arts, industry, and medicine. Credit, 3.

101. **GENERAL BACTERIOLOGY.**—Lectures and Laboratory. The work is designed to acquaint the student with the more important bacteriological techniques and with fundamental principles governing bacterial action. Particular attention is given to the study of laboratory methods essential for a basic understanding of applied bacteriology. Credit, 3.

102. **ADVANCED BACTERIOLOGY.**—A systematic study of pathogenic and non-pathogenic bacteria, disinfectants and antibiotics. Credit, 3.

120. **PHYSIOLOGY OF BACTERIA.**—Lectures and laboratory on the nature of the bacterial cell and on nutrition and metabolism with emphasis on certain

fundamental aspects of physiological processes and activities. Designed for students specializing in bacteriology and open to others who have sufficient chemistry, general biology, and botany. Credit, 5.

130. SPECIAL PROBLEMS IN BACTERIOLOGY.—Technical procedures and special investigational methods. The scope of this course can be varied to meet the individual requirements of a group of students specializing in the fields of agronomy, dairy industry, food technology, environmental sanitation or medical technology. Credit, 3-4.

150. STUDIES OF SPECIAL BACTERIAL GROUPS.—A comprehensive study of the more important anaerobic species; study of fecal, oral and skin streptococci, with special reference to their differentiation. The procedure for fecal flora studies, and the technique of isolating single bacterial cells are included. Credit, 3.

160. IMMUNOLOGY.—Consideration will be given to bacteriological, immunological and serological procedures. Recent advances in these fields and associated fields as that of viruses, Rickettsiae, etc., will be discussed and demonstrated. Credit, 3-6.

170. SANITARY BACTERIOLOGY.—A detailed study of laboratory methods for the sanitary control of all types of waters, for milk and milk products and for drinking and eating utensils. Practical application of these methods will be made through field studies. Credit, 3.

190. SEMINAR.—Lectures or reports on current literature. Credit, 1-4.

192. CLINICAL LABORATORY METHODS.—The purpose of this course is to familiarize the student with routine clinical laboratory procedures and the interpretation of analytical results. Credit, 3-6.

193. MEDICAL TECHNOLOGY.—Lectures on the medical significance and interpretation of clinical laboratory procedures. Subjects included are: bacteriology, histology, parasitology and serology. Credit, 6.

194. MEDICAL TECHNOLOGY.—Continuation of course 193. Subjects included are: clinical chemistry, hematology, basal metabolism, laboratory records and laboratory administration. Weekly seminars are included. Credit, 6.

195. MEDICAL TECHNOLOGY.—Laboratory application of clinical procedures in a hospital certified by the American Medical Association for the instruction of Medical Technologists. Subjects included are: bacteriology, histology, parasitology and serology. Credit, 4.

196. MEDICAL TECHNOLOGY.—Continuation of course 195. Subjects included are: clinical chemistry, hematology and basal metabolism. Credit, 4.

200. THESIS.—Some bacteriological problem related to agriculture, food, or public health. Distributed as may be most beneficial for research work. Time and credit by arrangement. Credit, 10-30.

With the assistance of a faculty adviser a proper selection of courses permits the student to specialize in the field of medical technology. This curriculum involves a cooperative program jointly supported by the Graduate School of the University and the laboratories of the Bingham-Rockefeller Foundation.

COURSES FOR MINOR CREDIT ONLY

51, 52. ADVANCED BACTERIOLOGY.—Studies on bacterial metabolism and the influence of environmental factors on growth and viability. The differentiation and identification of bacterial species by morphological, cultural, physiological, and serological studies. The combined courses not only give to the student a comprehensive picture of the various forms of existing bacteria, but develop a

special technique for the isolation, cultivation, and identification of both pathogenic and non-pathogenic species. Credit, 3 each semester.

Prerequisite: for 51 Bacteriology 31A or its equivalent;
for 52 Bacteriology 51 or its equivalent.

81, 82. **APPLIED BACTERIOLOGY.**—These two courses covering a full year's work are designed to give the student a working knowledge of present-day applied bacteriology. The subjects receiving special consideration include studies on disinfectants and methods of determining phenol coefficients; sanitary examination of water supplies and of shellfish; study of bacteriological principles which apply to preservation, fermentation, spoilage, and methods of sanitary examination of foods; methods of examining the sanitary quality of milk and milk products; the groups of bacteria normally present in milk and the factors which influence their development, and a consideration of the role of milk in the transmission of disease. Credit, 3 each semester

Prerequisite, Bacteriology 51 or its equivalent.

Public Health

Environmental Sanitation: Through the cooperation of the Massachusetts Department of Public Health, provision has been made to offer the following courses, on a graduate level, for a limited number of students interested in environmental sanitation; and who intend to prepare for positions as sanitarians with Federal, State or local health agencies. In addition to the University requirements for admission, applicants as undergraduates must have majored in the field of chemistry and biology or submit acceptable evidence of equivalent experience as a full-time employee of official or voluntary health agencies.

COURSES FOR MAJOR OR MINOR CREDIT

130. SPECIAL PROBLEMS IN PUBLIC HEALTH.	Credit, 3-6
161, 162. GENERAL AND COMMUNITY SANITATION.	Credit, 3 each semester
164. WATER MICROSCOPY.	Credit, 3
170. SANITARY BACTERIOLOGY. (See Bacteriology 170)	Credit, 3
179. STATISTICS. (See Agr. Economics 179)	Credit, 3
184. ADMINISTRATION.	Credit, 3
186. FIELD STUDIES IN ENVIRONMENTAL SANITATION.	Credit, 3
188. EPIDEMIOLOGY AND COMMUNICABLE DISEASE CONTROL.	Credit, 3
190. SEMINAR.	Credit, 1 each semester
200. THESIS.	Credit, 10

With the assistance of a faculty adviser a minimum of six semester courses must be selected from the following which are offered by cooperating departments within the University or by the professional staff of the Massachusetts Department of Public Health. This program, when approved by the Department and the Director of the Graduate School, will fulfill the student's minor requirements.

1. PUBLIC ADMINISTRATION.	See Economics 161
2. ENTOMOLOGY (Medical).	See Entomology 74
3. FOOD PRESERVATION.	See Food Technology 75
4. EXAMINATION OF FOOD PRODUCTS.	See Food Technology 192
5. FOREST MANAGEMENT OF WATER SHEDS.	See Forestry 51
6. MARKET MILK.	See Dairy Industry 52
7. ELEMENTS OF MEAT PACKING.	See Animal Husbandry 53
8. INDUSTRIAL MYCOLOGY.	See Botany 66
9. ADVANCED NUTRITION—METABOLISM OF THE MAJOR FOODSTUFFS.	See Home Economics 103

10. ANIMAL PARASITOLOGY. See Zoology 69, 70.
 11. SANITARY ENGINEERING (Sewerage). See Civil Engineering 78.
 12. CHEMISTRY OF WATER, SEWAGE AND SEWAGE SLUDGE. See Chemistry 63.
 13. WATER SUPPLY. See Civil Engineering 77.
 PUBLIC HEALTH NUTRITION: With the proper selection of courses students may specialize in a program of graduate study recommended by the American Dietetics Association to qualify as public health nutritionists. This program has been developed in cooperation with the School of Home Economics.

Botany

A. VINCENT OSMUN in Charge

COURSES FOR MAJOR OR MINOR CREDIT

106. HISTORY OF BOTANY.—Assigned reading and written reports.
 Credit, 1-2 each semester.
 Professor OSMUN.
108. THE COMPARATIVE ANATOMY OF GREEN PLANTS.—The anatomy, evolution and taxonomy of chlorophyllous plants, including extinct as well as living forms. Lectures interpret anatomical data in accord with such principles as algal tendencies and parallelisms, isomorphic and heteromorphic alternation, the landward migration, telome concept, rise and development of atreacheates and tracheates, stelar evolution and wood anatomy, angiosperms as the ultimate evolutionary types.
 Credit, 3 each semester.
 Professor TORREY.
109. THE EVOLUTION AND TAXONOMY OF ANGIOSPERMS.—A study of the angiosperm orders from the standpoint of reproductive morphology, ecology, evolution, economics and history. Illustrative types are drawn from the State herbarium, while forms for laboratory dissection are supplied from greenhouses or from preserved materials. The course was formulated with the needs of horticulturalists as well as botanists in mind
 Credit, 3-5 each semester.
 Professor TORREY.
110. SYSTEMATIC MYCOLOGY.—Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection, and preservation of fungi; systems of classification; collateral reading. Given in alternate years.
 Credit, 3 each semester.
 Assistant Professor BANFIELD.
111. PLANT PHYSIOLOGY.—Advanced study in physiology. Individual conferences, reports, and critical analyses of literature are included. Creative research is carried through to completion. Preparation of manuscripts is encouraged.
 Credit, 3-5 each semester.
 Associate Professor KOZLOWSKI.
112. ADVANCED PLANT PATHOLOGY.—Detailed study of the basic principles of plant pathology including phenomena of infection, interaction of host and parasite, sources of inoculum, agencies of distribution of plant pathogens, factors engendering epiphytotics; the basic methods of plant disease control as involved in practices tending to prevent infection, the use of resistant varieties, chemotherapy and soil management.
 Credit, 3 each semester.
 Assistant Professor BANFIELD.

113. FOREST PATHOLOGY.—A lecture course dealing with the more common and important fungus diseases and physiological troubles, and with wood decay caused by saprophytic fungi which affect forest trees and forest practice.

Credit, 2.

THE DEPARTMENT.

114. INSECT TRANSMISSION OF PLANT DISEASES.—A course of study in the fundamental role played by insects in the inception, dissemination, and epiphytotic development of plant disease.

Credit, 2

Assistant Professor BANFIELD.

115. PLANT ECOLOGY.—A general survey of the relationships of plants to their environment including a study of environmental factors (autecology)—soil, water, temperature, light, atmosphere, and the biotic factors—and of plant communities (synecology) with special emphasis on the structure and succession of plant communities in New England.

Credit, 3

Associate Professor HODGE

116. PLANT GEOGRAPHY.—A survey in lecture and readings of descriptive and historical plant geography as well as the basic principles governing the natural distributions of plants. Included as topics are problems of dispersal and migration, endemism, species senescence, discontinuous distributions, polyphyletic, continental drift, and geographical aspects of polyploidy.

Credit, 1-2

Associate Professor HODGE

117. MICROTECHNIQUE.—The preparation of microscopic mounts including the use of biological stains with the infiltration, celloidin and paraffin methods and the use of slide and rotary microtomes. The rewards of careful work are improvement in manipulative technique, better orientation in the field of plant structures, an enhanced aesthetic appreciation, and a valuable collection of several hundreds of microscopic mounts.

Credit, 2

Professor TORREY

119. PHOTOGRAPHIC TECHNIQUE.—The practical use in biological science of basic photographic techniques including general photography, photomicrography, photomicrography, preparation of microfilm strips and lantern slides, developing, printing, and enlarging.

Credit, 1

Associate Professor HODGE and Assistant Professor BANFIELD

180. PROBLEMS IN BOTANY.—Individual assignments in morphology, taxonomy, physiology or pathology.

Credit, 2-4 each semester

THE DEPARTMENT

190. BOTANICAL LITERATURE.—Assigned reading.

Credit, 1-4

THE DEPARTMENT

200. THESIS.—Research on an approved problem.

Credit, 10-30

COURSES FOR MINOR CREDIT ONLY

51, 52. PLANT PATHOLOGY.

Credit, 3 each semester

Assistant Professor BANFIELD

66. INDUSTRIAL MYCOLOGY.

Credit,

Assistant Professor BANFIELD

67, 68. PLANT PHYSIOLOGY.

Credit, 3 each semester

Assistant Professor KOZLOWSKI

84. THE FERNS.

Credit,

Professor OSMUND

Chemistry

W. S. RITCHIE in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101. **INORGANIC PREPARATIONS.**—Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Credit, 3-5 each semester.
Professor SMITH.

102. **INORGANIC CHEMISTRY OF THE LESS FAMILIAR ELEMENTS.**—Lectures and collateral reading on the descriptive chemistry of some of the less common elements such as boron, gallium, indium, thallium, the lanthanides, fluorine, titanium, vanadium, tantalum, tungsten, and uranium. Correlations between structure or spatial configurations and chemical properties will be stressed to the extent permitted by modern data. Credit, 3.
Assistant Professor ROBERTS.

103. **PHYSICAL CHEMICAL MEASUREMENTS.**—Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent hydrolysis of aniline hydrochloride from conductivity measurements; solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; absorption of iodine by charcoal; determination of hydrogen ion concentration. To each student separate work will be assigned. Credit, 3-5 each semester.
Professors FESSENDEN and SMITH.

105. **CHEMICAL THERMODYNAMICS.**—A study of the application of thermodynamics of chemical problems. Credit, 3.
Professor FESSENDEN.

106. **ATOMIC AND MOLECULAR THEORY.**—This course includes a consideration of the fundamental particles, natural and induced radioactivity, atomic theory based upon atomic spectra and the quantum theory, the nature of chemical binding, and molecular theory. Credit, 3.
Professor SMITH.

108. **CHEMICAL SPECTROSCOPY.**—This course is designed to give students practice in the use of spectroscopic equipment in solving chemical problems. The lecture work of the course will include discussions of (1) the design and use of instruments, (2) the elementary theory of spectra, and (3) the application of spectroscopy to chemical problems. The laboratory work will include practice in the use of the spectrometer and the spectrograph for the analysis of flame, arc, and spark spectra, and the use of the spectrophotometer for absorption measurements. Photographic procedures will be discussed and used in connection with the operation of the spectrograph. Credit, 3.
Professor SMITH.

121. **ADVANCED ANALYTICAL CHEMISTRY.**—Laboratory. This course consists of special work to meet the needs of the individual student. It may consist of ultimate analysis, electro-analysis, the analysis of definite classes of materials such as fertilizers, ores, insecticides, alloy or materials containing the rarer elements, and the use of organic reagents. Credit, 3-5 each semester.
Assistant Professor ROBERTS.

123. **INTRODUCTION TO MICRO-CHEMISTRY.**—Laboratory. Designed to illustrate the applications of micro technique to synthesis, analysis, and characterization. The microscopic work will include the optics of the microscope, micrometry, the microscopic study of fibres, crystals, and physiochemical phenomena and an introduction to microscopical qualitative analysis. The quantitative work will include the determination of carbon, hydrogen, nitrogen and halogen in organic materials and selected inorganic determinations.

Prerequisite, Chemistry 66, 30, 83, or the equivalent. Credit, 3-5 each semester

Assistant Professor ROBERTS.

130. **ADVANCED ORGANIC CHEMISTRY.**—Lectures. This course includes special topics such as stereochemistry, resonance, free radical reactions, reaction mechanisms, molecular rearrangements, etc. Emphasis will be given to recent developments and contributions. Given in alternate years. Credit, 3.

Prerequisite, Chemistry 181 or its equivalent. Associate Professor CANNON.

131. **ADVANCED ORGANIC CHEMISTRY.**—Laboratory. More difficult syntheses of organic compounds will be assigned to the individual student. These compounds will frequently be those desired as starting materials for research. Their preparation will require the use of the original literature. Credits, 3-5.

Prerequisite, a year course in Organic Chemistry

Professors CANNON and RITCHIE.

132. **ADVANCED ORGANIC CHEMISTRY.**—Lectures. A second course alternating with Chemistry 130. Given in alternate years. Credit, 3.

Prerequisite, Chemistry 181 or its equivalent. Associate Professor CANNON.

134. **ADVANCED BIOCHEMICAL LECTURES.**—Lectures on recent developments in the chemistry of proteins, lipids, carbohydrates, enzymes, and other materials of biological significance. The organic chemistry supporting the several major fields of applied biology will be emphasized. Credit, 3

135. **BIOCHEMISTRY LABORATORY METHODS.**—Advanced Laboratory work or preparation, examination, and analytical techniques for protein, carbohydrate lipids, enzymes, etc. Methods of colloid chemistry will be included. Individual problems and work will be assigned as far as possible to meet individual requirements. Credit, 3-5 each semester

136. **ADVANCED BIOCHEMICAL ANALYSIS.**—Advanced laboratory course in analytical methods applicable to naturally occurring materials including foods feeds, etc. Research methods and techniques will be introduced as well as routine methods. Credit, 3-5

137. **BIOCOLLOIDS.**—An introduction to the principles of surface chemistry that apply to colloid systems. Major consideration given to the emulsions and hydrophillic systems encountered in fields of applied biology. Collateral reading and preparation of literature reviews in the student's special field necessary. Credit,

Credit,

139. **CHEMISTRY OF NATURAL PRODUCTS.**—The lectures and collateral readings will deal with the chemistry of some classes of natural compounds which are of biochemical and economic interest. Proteins, the sugars, starch, cellulose polyuronides, lignin, glucosides, alkaloids, enzymes, purines, pyrimidines, and pigments will be considered. Credit,

Credit,

151. **SEMINAR.**—Conferences, reports, or lectures. Credit, 1 each semester

Professor RITCHIE

178. **ADVANCED PHYSICAL CHEMISTRY.**

Credit,

Professor FESSENDE

181. **ADVANCED ORGANIC CHEMISTRY.**—Lectures. An advanced survey course designed for first year graduate students. Credit, 3.
Prerequisite, a year course in Organic Chemistry. Associate Professor CANNON.
182. **QUALITATIVE ORGANIC CHEMISTRY.** Credit, 3.
Associate Professor CANNON.
183. **ADVANCED QUANTITATIVE CHEMISTRY.** Credit, 3.
Assistant Professor ROBERTS.
185. **THEORETICAL INORGANIC CHEMISTRY.**—Lectures. Credit, 3.
Prerequisites, Chemistry 65 and 66. Professor SMITH.
188. **HISTORY OF CHEMISTRY.**—Lectures. Credit, 3.
Professor RITCHIE.
192. **SPECIAL INVESTIGATIONS.**—A continuation of Course 92, for graduate students majoring in chemistry. The student will have the opportunity to continue studying the methods of research. Problems of definite character will be assigned to the student in the various fields of chemistry. It will be necessary for the student to report on pertinent literature. Credit determined by work done. Both Semesters. THE DEPARTMENT.
200. **THESIS.**—Research, and in the case of a degree, the preparation of an acceptable thesis in agricultural, analytical, inorganic, organic, physiological, or physical chemistry, under the direction of the professor in charge of the work. Credit, 10-30.

COURSES FOR MINOR CREDIT ONLY

- 51, 52.—**ORGANIC CHEMISTRY.** Credit, 4 each semester.
Professor RITCHIE.
63. **CHEMISTRY OF WATER, SEWAGE AND SEWAGE SLUDGE.** Credit, 3.
Prerequisite, Chemistry 30, and permission of the instructor.
- 65, 66. **PHYSICAL CHEMISTRY.** Credit, 4 each semester.
Professors FESSENDEN AND SMITH.
79. **BIOCHEMISTRY.** Credit, 4.

Dairy Industry

D. J. HANKINSON in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101. **HISTORY AND DEVELOPMENT OF DAIRYING.**—A review of the early history of dairying and factors in the industry contributing to its present development. Credit, 3.
102. **ICE CREAM PROBLEMS.**—A study of existing scientific, technical, and marketing problems in the field of ice cream making. Credit, 3.
103. **MARKET MILK PROBLEMS.**—Consideration of production, processing, and distribution of milk, the nutritional value of milk, chemical and bacteriological aspects of milk handling. Credit, 3.
104. **SURPLUS MILK PROBLEMS.**—The economical disposal of seasonal surpluses through cheeses, butter, milk drinks, etc. Credit, 4.

105. DAIRY PLANT MANAGEMENT.—The selection, construction, and arrangement of dairies and dairy machinery, and economical operation of same.

Credit, 3.

195, 196. SEMINAR.

Credit, 1 each semester.

200. THESIS.—Original research work having a bearing on some important problem in dairying.

Credit, 10.

COURSES FOR MINOR CREDIT ONLY

52. MARKET MILK.—A study of the various phases of the market milk industry: sanitary production, transportation, pasteurization and handling in the city plant, marketing, delivery systems, milk and its relation to public health, inspection, milk laws, food value, and advertising. Cultured milk and other milk drinks also are included. Some milk plants are visited.

Credit, 4.

75. DAIRY CHEMISTRY.—The various physical and chemical properties of milk, milk products, and their components are studied. Testing and control methods commonly used commercially for milk and dairy products are included; moisture and fat determinations, casein, salt, and acid tests, work with the Mojonnier apparatus, and other applied chemical tests are taken up in the laboratory.

Credit, 3.

77. BUTTER AND CHEESE MAKING.—Half of the semester is devoted to butter making, the remainder to cheese making, condensed and powdered milks. The various phases of the butter industry studied are: separators and cream separation; pasteurization, neutralization, and ripening of cream, preparation of starter cultures, churning, marketing, and scoring of butter; creamery management. The work in cheese making includes cheddar, cream, Neufchatel, cottage, processed cheese, etc. The manufacture of condensed and powdered milk, and commercial casein is also covered.

Credit, 4.

78. ICE CREAM MAKING.—The course includes a study of the principles and practices of ice cream making. The effects of such factors as composition, quality, pasteurization, homogenization, aging and freezing on the finished product are considered. Sherbets, ices, fancy and individual forms, and all flavors of ice cream are studied. Some time is devoted to refrigeration machinery, delivery equipment, and merchandising methods as they are related to the industry.

Credit, 4.

79, 80. SEMINAR.—The course consists of a study of research done by the experiment stations, also a review of foreign literature. Students prepare papers on timely dairy subjects. Frequent addresses are made to the class by visiting authorities in dairying.

Credit, 1 each semester.

Economics and Government

PHILIP L. GAMBLE in Charge

COURSES FOR MAJOR OR MINOR CRÉDIT

110. HISTORY OF ECONOMIC THOUGHT.—A general study of the development of economic thought from its ancient beginnings; the contributions of the various schools; recent changes in economic history.

Credit, 3 each semester.

THE DEPARTMENT

112. ECONOMIC HISTORY OF THE UNITED STATES.—A study of the significant factors in the economic development of the nation.

Credit,

Assistant Professor HALLE

113. CENTRAL BANKING.—A study of the organization and policies of the major central banks with special reference to the Federal Reserve System.

Credit, 3.

Professor GAMBLE.

140. PRINCIPLES AND PROBLEMS OF LAND ECONOMICS.—This course deals principally with the characteristics and classification of land, present and future uses of land, private property and the control over property, land income and the value of land.

Credit, 3.

THE DEPARTMENT.

153. MONEY, BANKING, AND CREDIT.—A critical survey of the development and operation of the monetary and banking systems of the United States.

Credit, 3.

Professor GAMBLE.

154. CORPORATION FINANCE.—An analysis of the financial policies of the corporation as a form of business organization, together with its social implications.

Credit, 3.

Associate Professor KIMBALL.

155. ECONOMICS OF CONSUMPTION.—The purpose of this course is a consideration of the importance of consumption in modern industry and commerce. It includes a study of the laws of consumption, standards of living, sources and factors determining family incomes, and of the administration of these incomes as shown by the expenditures of the nation and of various groups. The relation of consumption to the problems of population and to the development of society is also studied. Lectures, assigned readings, and class discussions.

Credit, 3.

Assistant Professor HALLER.

156. BUSINESS FLUCTUATIONS.—A study of business fluctuations and an analysis of the current business cycle theories.

Credit, 3.

Associate Professor KIMBALL.

158. THE FUNDAMENTALS OF COOPERATION.—History, principles and business relations. (1) A Survey of the development, methods, and economic results of great cooperative movements; (2) the organization of producers and consumers abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful cooperative endeavor and practical working plans for cooperative association.

Credit, 3.

THE DEPARTMENT.

160. PUBLIC UTILITIES AND THEIR REGULATION.—The study will include the problem of social control of monopolies and industries affected with a public interest.

Credit, 3.

THE DEPARTMENT.

170. MONOPOLIES.—A study of the growth, development, and social control of monopolies.

Credit, 3.

Assistant Professor HALLER.

173. MODERN ECONOMIC THEORY.—A study of current theories about value, distribution and prices.

Credit, 3.

THE DEPARTMENT.

174. ADVANCED ECONOMIC THEORY.—A study of the classical and non-classical theories of value and distribution. Analysis of fundamental concepts and the relation of these to current problems of production, distribution and exchange.

Credit, 3.

Associate Professor KRAVIS.

175. CURRENT ECONOMIC PROBLEMS AND LITERATURE.—Department seminar throughout the year. Credit, 1-3 each semester.

THE DEPARTMENT.

176. PRINCIPLES OF TRANSPORTATION.—The development of highway, waterway, and railway transportation, and its relation to the development of the country; the principles governing the operation and control of transportation agencies; present-day problems. Lectures, text, and field work. Credit, 3.

THE DEPARTMENT.

177. ECONOMICS OF INTERNATIONAL TRADE.—A study of the policies, principles, and practices of international trade. Credit, 3.

Assistant Professor HALLER.

178. PUBLIC FINANCE.—A study of the principles underlying public expenditures, public borrowing and taxation. Credit, 3.

Professor GAMBLE.

179. LABOR PROBLEMS.—Reading and investigation. By arrangement. Credit, 3.

Associate Professor MORRIS.

180. LABOR LEGISLATION.—A study of federal and state legislation affecting labor. Credit, 3.

Assistant Professor HOAR.

185. ECONOMIC INSTITUTIONS AND PRACTICE IN RELATION TO THE STATE.—Studies in farm relief measures, taxation, bounties, subsidies, government control of commerce and industry. Credit, 2-5 each semester.

Professor GAMBLE.

191-192. INVESTIGATION IN VARIOUS PROBLEMS RELATED TO ECONOMICS.—Credits to be determined by time spent and reports submitted.

THE DEPARTMENT.

200. THESIS.—Research work in economics will be developed by four principal methods; namely, historical, statistical, accounting, and general field investigation. In all instances mastery of research methods includes facility in investigation, tabulation, and interpretation of results. Credit, 10-30.

COURSES FOR MINOR CREDIT ONLY

25. APPLIED ECONOMICS.—A course offered primarily for high school teachers (others may elect), which is intended to appraise such current economic questions as the business cycle, taxation, banking, international trade reparations, economic planning, and similar problems in the light of economic principles.

Credit, 3 each semester

THE DEPARTMENT

51. BUSINESS AND INDUSTRY.—Study of the organization and administration of business enterprise from the point of view of production. The course stresses administrative functions of production, finance, credit, and the relation between government and business. Credit, 3

THE DEPARTMENT

61. PUBLIC ADMINISTRATION.—A general survey of the field of public administration. Special emphasis will be placed on the principles of organization the functions performed by administration, and the relation of administration to democracy. Credit, 3

THE DEPARTMENT

62. **ADMINISTRATIVE LAW.**—A study of government regulatory activities in relation to industry, agriculture, and labor, with emphasis on the legal framework within which these activities operate.

Credit, 3.

THE DEPARTMENT.

63. **POLITICAL PARTIES AND ELECTIONS.**—A study of the political process, and the nature and history of parties, pressure groups, nomination and elections.

Credit, 3.

THE DEPARTMENT.

64. **MUNICIPAL GOVERNMENT.**—A survey of the government structure and functions of American municipalities. Special attention is given to administrative problems arising from such functions as protection, education, welfare, correction, city planning and zoning.

Credit, 3.

THE DEPARTMENT.

65. **CONSTITUTIONAL LAW.**—An historical study of the fundamental rights and guarantees under the American Constitution as interpreted by decisions of the Supreme Court.

Credit, 3.

THE DEPARTMENT.

66. **AMERICAN POLITICAL THOUGHT.**—A study of the development of American political thought from colonial times to the present, with emphasis upon writings of the period.

Credit, 3.

THE DEPARTMENT.

67. **INTERNATIONAL GOVERNMENT.**—A study of international organization in the twentieth century, with emphasis upon the League of Nations, the World Court, and the United Nations and its affiliated agencies.

Credit, 3.

Assistant Professor FERWERDA.

68. **INTERNATIONAL LAW.**—A study of the origin, character, and function of international law.

Credit, 3.

Assistant Professor FERWERDA.

93, 94. **SEMINAR.**—A study of special problems in the field of government.

Credit, 3 each semester.

Assistant Professor FERWERDA.

Education

ALBERT W. PURVIS in Charge

Before being admitted to candidacy for the master's degree with a major in Education, the student must have, in addition to college requirements:

1. Two majors (18 hours each) or one major and 2 minors (12 hours each) in the subject-matter fields to be taught.
2. Approximately 15 hours of such fundamental courses as 51, 53, 72, 83, etc., listed in the undergraduate catalogue.
3. Experience in teaching. Students entering without teaching experience must arrange for practice teaching as soon as possible.

COURSES FOR MAJOR OR MINOR CREDIT

102. **APPRENTICE TEACHING IN AGRICULTURE.**—An opportunity offered occasionally to study this type of vocational education by participating in it. The work is that of an assistant teacher under supervision with a schedule of classes to teach and a prescribed line of study to complete. For one or two full semesters off campus.

Credit, 6.

By arrangement.

Assistant Professor OLIVER and Mr. TAFT.*

* In cooperation with the Vocational Division, State Department of Education.

103. **PROBLEMS IN VOCATIONAL TEACHING.**—The course deals with problems out of the experience of vocational teachers in Massachusetts. Constructive assignments bearing upon individual experiences are worked out in harmony with the campaigns for better teaching in vocational schools. Credit, 3.
By arrangement. Assistant Professor OLIVER and Mr. TAFT.*

104. **PRINCIPLES OF VOCATIONAL EDUCATION.**—A survey of the objectives, history and legal requirements of vocational education in the United States. Credit, 3.
By arrangement. Assistant Professor OLIVER and Mr. TAFT.*

108. **SECONDARY SCHOOL ADMINISTRATION.**—This course deals with those important problems in secondary schools in which teachers and administrators are both involved, including the general principles in admission, promotion, personnel, discipline, extra-curricular activities, supervision, tenure, salary schedules, etc. Credit, 2-3.
Professor PURVIS.

109. **ADMINISTERING SECONDARY SCHOOLS.**—This course considers such problems as housing, finance, schedule, the library, guidance, cafeteria, public relations, etc. Ordinarily this course will follow course 108 and is intended primarily for those who wish to prepare for administrative positions. Credit, 2-3.
Assistant Professor OLIVER.

110. **ADMINISTRATION OF EXTRA-CURRICULAR ACTIVITIES.**—The many problems of this phase of school work such as scheduling, financing, sponsorship, regulation of pupil participation are given general consideration. A more detailed study is made of some of the more important extra-curricular activities carried on in most of the secondary schools. Credit, 2-3.
Assistant Professor OLIVER.

113. **RURAL AND ELEMENTARY GRADED SCHOOLS.**—This course deals with the organization of rural and urban elementary schools. It considers such problems as community surveys, staff, lunches, transportation, extra-curricular activities, health programs, schedule, etc. Credit, 2-3.
Assistant Professor MCCARTHY.

114. **SUPERVISING ELEMENTARY EDUCATION.**—This course deals with general problems of supervision, the elementary curriculum, activity programs, course content, projects, core-curriculum, and other supervisory duties in the elementary schools. Credit, 2-3.
Assistant Professor MCCARTHY.

115. **SEMINAR IN EDUCATION.**—There are occasional challenges that have to be met when they appear. These are problems of method, demonstration, fact finding, personal study, professional improvement, development of the functions of the critic teacher, etc. The procedure may be either scheduled group meetings or individual conference. Credit, 2-3.
By arrangement. THE DEPARTMENT.

120. **SCHOOL LAWS OF MASSACHUSETTS.**—A review of the legal relations of the school personnel covering the usual experiences in school and community, presented in a series of selected cases having the support of court decisions. Credit, 3.
Professor PURVIS.

153. **EDUCATIONAL TESTS AND MEASUREMENTS.**—To aid teachers and administrators in setting up a school testing program, analyzing the results, and plan-

* In cooperation with the Vocational Division, State Department of Education.

ning a remedial program. Each instrument of evaluation is considered from both theoretical and practical angles. Credit, 2-3.

Assistant Professor ROURKE.

161. METHODS IN ADULT EDUCATION.—Group and individual instruction with adults and methods of developing leaders to carry on the work in the field. Credit, 2-3.

Professor_____

166. PREPARATION AND USE OF AUDIO-VISUAL AIDS.—Study is made of available media of audio-visual aids to instruction, construction of visual material, and accepted methods of use. Credit, 2-3.

Professor_____

167. ORGANIZATION OF A SCHOOL AUDIO-VISUAL PROGRAM.—Attention is given to methods of surveying school needs, to purchase of equipment, to establishment and use of audio-visual libraries, to scheduling of equipment and materials and to supervision of methods of using the materials by the teachers.

Credit, 2-3.

Professor_____

180. HISTORY OF EDUCATION.—A survey of educational movements from early times to the present, emphasizing their interpretation in the light of modern problems. Individual reports on supplementary readings. Credit, 2-3.

Professor PURVIS.

181. COMPARATIVE EDUCATION.—Studies of contemporary educational systems in such countries as England, France, Germany, Russia, China, etc., and a comparison of them with that of the United States. Credit, 2.

Professor_____

183. SECONDARY EDUCATION.—This course gives attention to the aims, relations, organizations, and functions of the high school and the activities that carry these out through curricula, schedules and extra-curricular organizations. Evaluation of procedures is stressed. Credit, 2-3.

Assistant Professor ROURKE.

188. THE SCHOOL CURRICULUM.—A study of the principles and techniques involved in curriculum building. Recent programs will be studied and evaluated. Readings and reports. Credit, 2-3.

Assistant Professor ROURKE.

191. EDUCATIONAL RESEARCH AND STATISTICS.—The principles and methods of research with special emphasis upon the technique used in Education. Statistics are studied chiefly from the standpoint of reporting and understanding the results of research. Required in first semester of students who anticipate completion of a thesis or problem in the current year. Credit, 2.

Professor PURVIS.

100. PROBLEM.—Work necessary to achieve an answer to a particular question in the educational field. Question to be of student's choosing, if possible. It may or may not involve original research and usually has only local significance. This may be chosen instead of a thesis. Credit, 4.

Prerequisite, Education 191.

THE DEPARTMENT.

200. THESIS.—A completed piece of work on some specific aspect of the educational field with necessary review of the literature pertaining to it. Original research is expected and the study should have more than local significance. Credit, 8.

Prerequisite, Education 191.

THE DEPARTMENT.

Engineering

COURSES FOR MINOR CREDIT ONLY

Agricultural Engineering

51. **HOUSE PLANNING.**—Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen, and lighting, heating, water supply, and sewage disposal will be studied, together with a brief history of house materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing, and to maintenance and overhead expense. Credit, 3.

Associate Professor MARKUSON.

73. **FARM STRUCTURES.**—A study of the strength and durability of building materials, construction systems and the mechanical principles underlying their use in farm-construction. In the drafting room, studies will be made of some major farm building and complete working drawings finished in all essential details. Credit, 3.

Associate Professor MARKUSON.

80. **FOOD PROCESS ENGINEERING.**—A study of food processing machinery, steam boilers, evaporators, pumps, refrigeration machinery, and heat controlling devices. The course deals with problems of heat transfer in foods and processing equipment. Credit, 3.

Assistant Professor PFLUG.

83, 84. **AGRICULTURAL ENGINEERING PROBLEMS.**—This course consists of individual problems chosen by the students under guidance of the department. The work is of an advanced nature, supplementing that of the regular agricultural engineering curriculum. Credit, 3 each semester.

THE DEPARTMENT.

Civil Engineering

26. **ROUTE SURVEYING.**—The principles of location, curves and earthwork and horizontal and vertical control nets for highways, railroads, pipe lines, and transmission lines are considered. Credit, 3.

Prerequisites, C.E. 25 or C.E. 27.

Associate Professor HENDRICKSON.

34. **APPLIED MECHANICS (Statics).**—The following topics are considered in the study of statics: colinear, concurrent, non-concurrent and parallel force systems in a plane and in space: static friction problems; first and second moments. The free-body method of analysis is emphasized. Algebraic and graphical solutions are determined. Credit, 3.

Prerequisites, Physics 26; Math. 31.

Associate Professor OSGOOD.

51. **STRENGTH OF MATERIALS.**—The following topics are considered: elementary stresses and strains; combined stresses; riveted joints; torsion; shear and bending moments; stresses and deflections in beams; statically indeterminate beams; columns. Credit, 4.

Prerequisites, C.E. 34; Math. 32.

Professor WHITE

52. **APPLIED MECHANICS (Kinetics).**—This is a continuation of Civil Engineering 34 into the field of kinetics. It includes linear and angular motion; impulse and momentum, and work, energy and power. Credit, 3.

Prerequisites, Math. 32; C.E. 34.

Professor WHITE

55. **HIGHWAY ENGINEERING.**—The design features of highway construction and relative merits of various types of highway surfaces are discussed in class. Plans, profiles, cross sections, and specifications for a short section of highway are prepared. Credit, 3.

Prerequisites, C.E. 26; C.E. 30 or permission of instructor.

Associate Professor HENDRICKSON.

76. **FLUID MECHANICS.**—The following topics are considered: properties of fluids, gas laws, viscosity, static pressures, gages, buoyant forces, dynamics of fluids, Bernoulli's theorem, flow in pipes, orifices, nozzles, weirs and open channels. Hydraulic similitude is also discussed. Credit, 4.

Prerequisites, Physics 26; Math. 32; C.E. 52.

Professor MARSTON.

77. **WATER SUPPLY.**—This course considers the engineering aspects of public water supply systems and includes the following topics: quantity of water required; hydrology; collection systems; distribution systems; pumping machinery; purification work. Credit, 4.

Prerequisite, C.E. 76 or C.E. 75 concurrently. Assistant Professor ANDERSON.

78. **SANITARY ENGINEERING (Sewerage).**—This course considers the engineering aspects of the design, construction, and maintenance of sewerage systems and includes the following topics: hydraulics of sewers, sanitary and storm sewers, sewage treatment, plant design and operation. Credit, 3.

Prerequisite, C.E. 77.

Assistant Professor ANDERSON.

80. **SOIL MECHANICS.**—This course is a study of the mechanical classification of soils based upon field and laboratory work and the validity of these classifications as a means of predicting soil behavior. The student is guided through case studies in embankment stability, seepage, and consolidation. Credit, 3.

Prerequisite, Geology 50.

Associate Professor HENDRICKSON.

Electrical Engineering

40. **FUNDAMENTALS OF ELECTRICAL ENGINEERING.**—This course is a study of the fundamental concepts of electricity including units, basic laws and applications to direct-current circuits, magnetism and electromagnetism, magnetic circuits in air and iron, induced voltages and inductance, generated voltages, capacitance, conduction in liquids and gases and batteries. Credit, 3.

Prerequisites, Math. 31; Physics 26.

Professor BROWN and Assistant Professor SMITH.

51. **ALTERNATING-CURRENT CIRCUITS.**—This course is a study of alternating currents in power and communication circuits. Subjects included are instantaneous relationships between electrical quantities, vector representation, sinusoidal and non-sinusoidal waves, single-phase and polyphase circuits, coupled circuits, power and power measurements, basic networks and filters. Credit, 3.

Prerequisite, E.E. 40.

Associate Professor LANGFORD.

53. **DIRECT-CURRENT MACHINERY.**—Direct-current generators and motors are studied with respect to their characteristics, design, operation, and applications. Special types of direct-current machines and control devices are also included in the course. Credit, 3.

Prerequisite, E.E. 40.

Professor ROYS.

54. **ALTERNATING-CURRENT MACHINERY.**—This course is a study of alternating-current generators, motors, transformers and converters with respect to their design, operation, control and applications. Credit, 4.

Prerequisites, E.E. 51 and E.E. 53.

Associate Professor WILSON.

74. **ELECTRONICS.**—This course includes the study of electron motion in electric and magnetic fields, basic electron optics, electron tubes and their characteristics, rectifiers and amplifiers through Class A applications. Credit, 3.

Prerequisite, E.E. 51.

Associate Professor LANGFORD.

75. **APPLIED ELECTRONICS.**—This is a continuation of course E.E. 74 and includes a study of electron tubes in power amplifiers, oscillators, control circuits and special applications. Credit, 3.

Prerequisite, E.E. 74.

Professor BROWN.

Mechanical Engineering

59. **MATERIALS OF CONSTRUCTION.**—The manufacture, processing and utilization of many of the diversified products entering into construction today.

Credit, 2.

Assistant Professor KEYSER.

61. **TESTING OF MATERIALS.**—A study of how the composition, structure, and treatment of materials influence their properties. Tests and observations are made to substantiate the theory. Metals are emphasized but tests are also performed on such materials as wood, concrete, plastics, sands and oils.

Credit, 2.

Professor BATES and Mr. COFFEY.

65. **HEAT ENGINEERING I.**—This course is a survey of the field of applied energy and is designed for engineering students outside of the mechanical engineering field. The application of the laws of heat to energy transforming devices is studied, but not as extensively as in M.E. 63 and 64. A study will be made of gases, vapors, fuels, combustion, heat transfer, atomic energy release, measurement of power, air compressors, fans, refrigeration and air conditioning.

Credit, 3.

Prerequisite, Physics 26; Mathematics 32.

Professor SWENSON

68. **KINEMATICS.**—Principles of mechanism, including velocity and acceleration diagrams, instant centers, gear teeth and gear trains, cams, and various speed transmissions.

Credit, 3

Prerequisites, M.E. 1; Physics 25; Math. 6.

Professor BATES

72. **FUNDAMENTALS OF METALLURGY.**—The course is a study of the structure and properties, manufacture and fabrication of metals and metal products, including metallurgical laboratory work with emphasis on metallography and X-ray techniques.

Credit, 2

Assistant Professor KEYSER

86. **INDUSTRIAL ENGINEERING.**—A broad course treating with the many problems encountered in a modern industry. Topics include types of organization management, plant location, arrangement of equipment, product design, method of production control, costs, wage payment systems and personnel relations.

Credit, 3

Professor WEAVER

87. **INDUSTRIAL MANAGEMENT.**—Management of industrial plants, cost systems, methods of fixing prices, methods of paying labor, welfare methods, methods of handling labor, equipment and material.

Credit, 3

Professor WEAVER

88. **TIME AND MOTION STUDY.**—Study of a number of jobs performed in industry with the objective of simplifying work, cutting costs, and computing standard times. Charts and curves will be used, supplemented by motion pictures of jobs in factories.

Credit, 3

Prerequisite, M.E. 28.

Professor WEAVER

English

COURSES FOR MINOR CREDIT ONLY

Any of the following courses as described and listed by number in the general College Catalogue may be selected to contribute to the requirements for a minor under any major where offerings in the Department of English are approved for a minor:

All courses from No. 50 to No. 80 inclusive.

Entomology

CHARLES P. ALEXANDER in Charge

COURSES FOR MAJOR OR MINOR CREDIT

- | | | |
|--|------------|-----------------------------|
| 101. Insect embryology; polyembryony; parthenogenesis; paedogenesis; heterogeny. | Credit, 2. | Assistant Professor SHAW. |
| 102. Advanced insect morphology. | | |
| Three credits first semester; two credits second semester. | Credit, 5. | Assistant Professor HANSON. |
| 103. Ancestry and development of insects, including fossil forms. | | |
| Two credits each semester. | Credit, 4. | Assistant Professor HANSON. |
| 104. Insect histology. | Credit, 2. | Assistant Professor SHAW. |
| 105. Animal luminosity; chemistry and physics of insect colors. | Credit, 1. | Professor SWEETMAN. |
| 107. Advanced insect physiology. | Credit, 3. | |
| Prerequisite, Entomology 81, or equivalent. | | Professor SWEETMAN. |
| 108. Advanced apiculture. | Credit, 2. | Assistant Professor SHAW. |
| 110. Insect pollination; insect products of value to man. | Credit, 2. | Assistant Professor SHAW. |
| 111. Insect behavior; insect architecture. | Credit, 2. | Assistant Professor SHAW. |
| 112. Geographic distribution of animals and plants, with particular reference to insects; insect migrations. | Credit, 2. | Professor ALEXANDER. |
| 113. Advanced biological control of insects and weeds. | Credit, 3. | |
| Prerequisite, Entomology 80, or equivalent. | | Professor SWEETMAN. |
| 114. Advanced animal ecology. | Credit, 3. | |
| Prerequisite, Entomology 79, or equivalent. | | Professor SWEETMAN. |
| 115. Advanced chemical control of insects. | Credit, 3. | |
| Prerequisite, Entomology 80, or equivalent. | | Professor SWEETMAN. |

117. Research methods in entomology. Credit, 3.
Professor SWEETMAN.
118. Legislative control of insects. Credit, 3.
Professor SWEETMAN.
125. History of entomology and classifications; lives and works of prominent entomologists. Credit, 4.
Two credits each semester. Professor ALEXANDER.
128. The international code of zoological nomenclature; advanced systematic entomology. Credit, 4.
Two credits each semester. Professor ALEXANDER.
140. COCCIDIOLOGY.—A study of the scale insects, their structure; habits; technique of mounting; identification, and control. Credit, 2.
Two 2-hour laboratory periods. Assistant Professor HANSON.
141. CLASSIFICATION OF MINOR ORDERS OF INSECTS.—Taxonomy of groups belonging to the smaller orders. Credit, 2.
Two 2-hour laboratory periods. Assistant Professor HANSON.
142. Techniques in the mounting and preservation of insects for study and display by means of fluids, slides, plastics, pinning, etc. Credit, 2.
Two 2-hour laboratory periods. Miss SMITH.
150. ADVANCED INSECT TAXONOMY.—Classification of various insect groups, indicating the latest methods in taxonomy and the principles of classification. Credit, 2.
Two 2-hour laboratory periods. THE DEPARTMENT.
160. NATURAL HISTORY METHODS.—A survey of modern practices in the field. This will involve a study of visual education, trailside museums, nature trails, and exhibitions of natural products. The making of lantern slides, charts, displays, and the working out of specific problems will be arranged according to individual needs. Hours by arrangement. Credit, 3.
Professor VINAL.
180. SEMINAR.—Reports on the current literature of entomology; special reports by resident and visiting speakers. Credit, 1.
One class hour.
200. THESIS.—Original work on one or more topics in insect morphology, systematic entomology, or in the fields of medical entomology, insect physiology, insecticides, biological control or apiculture. The thesis requires from one-half to two-thirds of the total working time of the student in his major field. Credit, 10-30.

COURSES FOR MINOR CREDIT ONLY

51. PESTS OF SPECIAL CROPS. Credit, 3.
- 53, 80. APPLIED ENTOMOLOGY. Credit, 3 each semester

55, 56.	INSECT TAXONOMY; IMMATURE STAGES OF INSECTS.	Credit, 3 each semester.
57.	INSECT MORPHOLOGY.	Credit, 4.
66, 85.	APICULTURE.	Credit, 3 each semester.
72.	FOREST ENTOMOLOGY.	Credit, 3.
74.	MEDICAL ENTOMOLOGY.	Credit, 2.
79.	ANIMAL ECOLOGY.	Credit, 3.
81.	INSECT PHYSIOLOGY.	Credit, 3.
87, 88.	SPECIAL PROBLEMS.	Credit, 1-3 each semester.

Biological Field Studies

Students electing to take special work in Natural History Methods or Biological Field Studies can satisfy requirements through proper selection of courses from the offerings in Entomology or Zoology-Physiology, as directed by their Major Adviser.

COURSES FOR MINOR CREDIT ONLY

61, 62.	PUBLIC RELATIONS IN NATURE RECREATION.	Credit, 3 each semester.
71, 72.	ADVANCED BIOLOGICAL FIELD STUDIES.	Credit, 3 each semester.
73, 74.	SPECIAL PROBLEMS IN NATURAL SCIENCE.	Credit, 3 each semester.

Floriculture

CLARK L. THAYER in Charge

COURSES FOR MAJOR OR MINOR CREDIT

A definitely outlined major or minor in floriculture is not catalogued at present but such a course may be arranged for individual students. The nature of the work to be taken up will depend upon the previous training and the type of problem desired by the candidate. Application should be made to the head of the department.

126. GARDEN MATERIALS.—Studies of specific plants or groups of plants which are used in gardening work. Questions concerning nursery methods of handling such plants are also included. Credit, 3.

175. COMMERCIAL FLORICULTURE.—Problems relating to factors concerned with the commercial production of flowers and plants under glass. Opportunity is also given for study of factors concerned with methods of distribution. Credit, 3.

179. CONSERVATORY PLANTS.—A consideration of subjects dealing with plant materials which are used primarily in conservatories for display purposes and in gardens in warmer climates. Credit, 3.

190. HISTORY OF FLORICULTURE AND FLORICULTURE LITERATURE.—Consideration of men and events that have influenced the developments of floriculture. Brief survey of floriculture literature. Required of all graduates in floriculture.

Credit, 3.

199. SEMINAR.—A review of scientific literature relating to floricultural practices, including various phases of greenhouse management, soils, fertilizers, plant propagation, growth regulators, insect pest and disease control, and other pertinent subjects.

Credit, 1-2 each semester.

200. THESIS.—For candidates taking major work in floriculture. With the facilities which are now available it is possible for graduate students to undertake problems in the following phases of floriculture; propagation of plants with constant water level; propagation of plants with continuous light and constant water level; production of cutflowers and pot plants with constant water level; production of cutflowers and pot plants with automatic surface watering. Problems in other phases of floriculture may be undertaken according to the needs and desires of the individual student.

Credit, 10.

COURSES FOR MINOR CREDIT ONLY

51. GREENHOUSE MANAGEMENT.	Credit, 3.
52. FLORAL ARRANGEMENT.	Credit, 3.
75. COMMERCIAL FLORICULTURE.	Credit, 3 each semester.
79. CONSERVATORY PLANTS (1950-51).	Credit, 2.
81. HERBACEOUS GARDENS AND BORDERS.	Credit, 3.
82. SEMINAR.	Credit, 3.

Food Science

Opportunity for advanced study in the subject of foods is provided in order that qualified students may better prepare themselves to serve the numerous interests engaged in providing the consuming public with a more desirable food supply. The plan for study arranged under this major, while intended to be flexible, requires the student to confine himself largely to the graduate courses offered in the following field: Bacteriology, Chemistry, Dairy Industry, Food Technology, and Foods and Nutrition. Courses, if properly selected, will satisfy both major and minor requirements. The proportionate contribution of each department will depend upon the student's special interests within the field but a minimum of six credits must be earned in each of the departments contributing to this major. Candidates for a degree in this major are assigned to an Advisory Committee composed of representatives of the departments concerned with the Director of the Graduate School as Chairman. This Committee will direct the student's program in the hope that a procedure may be arranged that will provide most adequate facilities for the expression of individuality. The general requirements for a degree in Food Science conform to those specified for the doctor of philosophy degree as required by several departments except that this major offers a wider range of subject matter. Students interested should consult the Director of the Graduate School.

Food Technology

CARL R. FELLERS in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101, 102. SPECIAL INVESTIGATIONS.—A series of individual problems and assignments covering plant lay-outs, process development, quality control and economics of production. Laboratory, pilot plant and library exercises.

Credit 2-6

THE DEPARTMENT

110, 111. THERMAL PROCESSING OF FOODS.—Biological and Physical Aspects. study of the factors affecting heat transfer in canned goods. Heating characteristics of canned foods packed in tin, glass, and other containers. Determination of thermal death points of spoilage microorganisms. Derivation of processing times and temperatures. Causes of spoilage and container failure. Principles of retort operation and control; instrumentation. Credit, 2.
 First semester—2 lectures or conferences. Credit, 3.
 Second semester—1 lecture, 1 4-hour laboratory. THE DEPARTMENT.

112. FREEZING AND REFRIGERATION.—Lay-out of cold storage plants. Practical refrigeration systems. Equipment and methods used in quick-freezing fruits, vegetables, meats, and marine products. Packaging and quality control. Domestic freezers and commercial frozen-food lockers. Credit, 2-4.
 Laboratory and class work. PROFESSOR FELLERS.

116. FOOD PACKAGING.—A study of the characteristics of all packaging materials including flexible films and how they meet the package requirements of various food products. Methods of testing for structural quality and performance, moisture and gas transmission, and other properties. Consideration of adhesives, lacquers and closures included. Occasional lectures by qualified representatives of industry. Plant visits in non-scheduled hours. Credit, 3.
 One 4-hour laboratory period; one or more class or discussion hours. Assistant Professor LEVINE.

121. EDIBLE FATS AND OILS.—This course covers the production and uses of edible fats and oils and their chemical nature in relationship to stability. The problem of oxidation and rancidity is considered with emphasis on cause of deterioration and methods of stabilization. Credit, 2.
 One class hour; one 2-hour laboratory period. MR. ZALKAN.

132. UNIT PROCESSES.—Unit processes pertaining to the food industries are covered. The work includes instrumentation, temperature measurement, blanching, processing, cooling, heat transfer, fluid flow, distillation, dehydration, evaporation, filtration, comminution, deaeration and extraction. Credit, 2.
 THE DEPARTMENT.

161, 162.—INDUSTRIAL PRACTICES.—Advanced laboratory and pilot plant work in the production of canned, frozen and dehydrated fruits, vegetables, meat, and fish products. The theory and practice in manufacturing jams, jellies and condiments as well as fermented, salted and smoked foods; cereal products and soups. Credit, 3 each semester.
 One class hour; one 4-hour laboratory period. Assistant Professor LEVINE.

171, 172. SEMINAR.—Assigned readings and reports from scientific and technical literature of food technology. Special lectures and round table discussions. Credit, 1-2 each semester.
 THE DEPARTMENT.

182. CONFECTIONS AND CEREAL PRODUCTS.—Candy making, maple products, sugar and fountain syrups, corn products such as starch, syrups, dextrose and their uses. Candied fruits and preserves. Flavoring essences, spices, carbonated beverages. This course also considers the principles of baking, doughs, and various prepared cereals and dry mixes. Credit, 3.
 One class hour; one 4-hour laboratory period. Assistant Professor LEVINE.

185, 186. **FISHERIES TECHNOLOGY.**—Marine products of commerce. Processed seafoods. Canning, curing, freezing and refrigeration. Spoilage problems. By-products. Chemical and microbiological aspects. Scientific literature. Industrial problems. Credit, 2-3 each semester.

One class hour plus laboratory work to be arranged. Professor FELLERS

191, 192. **EXAMINATION OF FOOD PRODUCTS.**—Factory and laboratory methods. Grades and quality factors; physical, chemical, microbiological and microscopical methods, and interpretation of results. Government and trade standards; Federal and State food regulations; mold and insect counts; plant control procedures will be stressed. Food preservatives and flavorings.

(The second semester is a continuation of 191 with emphasis on the public health aspects of food analyses and quality control; plant sanitation. Includes lectures by outside speakers in this field.)

One 4-hour laboratory period; one lecture. Credit, 3 each semester

Professor FELLERS and Mr. ZALKA

195. **BIOLOGICAL ASSAY OF FOODS.**—Provides laboratory training and practice in making animal and microbiological assays of food constituents, important to human and animal nutrition. Credit, 2-

THE DEPARTMENT

200. **THESIS.**—Research on some suitable problem in Food Technology. Facilities for nutrition research are provided by well-equipped chemical, physical and small-animal laboratories and poultry plant. Credit, 10-

COURSES FOR MINOR CREDIT ONLY

51. **FRUIT AND VEGETABLE PRODUCTS.**—This is a general elementary course covering food economics, production, distribution and processing. The applications of fundamental science to the food industries are pointed out. The laboratory exercises cover both the theory and practice of canning, freezing, and dehydration. The principles of packaging are considered. Fruit and vegetable products are prepared and graded. Credit,

One class hour; one 4-hour laboratory period. Professor FELLERS

52. **FOOD PRODUCTS AND ADJUNCTS.**—This is a continuation of 51. The laboratory work includes pickles and pickle products, maple products, citrus products, fruit syrups, soups, condiments and the preservation of meats, poultry and vegetables. The properties and uses of sugars, syrups, salt, enzymes, pectin, chemical preservatives and anti-oxidants are considered. Practice is given in the use and handling of instruments and equipment. Credit,

Two class hours; one 2-hour laboratory period. Professor FELLERS

75, 76. **FOOD PRESERVATION.**—This is a general course in food preservation and is intended only for those who desire a survey of the field in a condensed form. Not open to Food Technology majors. Credit, 3 either semester.

One class hour; two 2-hour laboratory periods. Mr. ZALKA

95, 96. **INTRODUCTORY RESEARCH METHODS.**—The application of the fundamental sciences to food technology research. Library and laboratory research on assigned individual problems. Credit, 2 each semester.

By arrangement.

Professor FELLERS and Assistant Professor LEVINE

Forestry and Wildlife Management

ROBERT P. HOLDSWORTH in Charge

Forestry

COURSES FOR MINOR CREDIT ONLY

51. FOREST MANAGEMENT OF WATERSHEDS.—Admission by approval of instructor. A study of forest site—water factor relationships; the improvement of watershed forests through applied silviculture; relative values of tree species or watershed uses; forests and the quality of water supplies. Field trips to several town and city watersheds. Credit, 3.
53. SILVICS.—Forest ecology as the basis for silvicultural practice. Credit, 3.
54. FOREST SOIL.—A study of the soil as it influences the growth and management of forests. Credit, 3.
55. ELEMENTS OF FOREST MENSURATION.—Methods of inventorying the forest growing stock; determination of wood volume; determination of growth rates. Credit, 3.
56. PRINCIPLES OF APPLIED SILVICULTURE.—Forest establishment and development through silvicultural practice. Credit, 3.
57. FOREST ECONOMICS AND POLICY.—The development of an American forest policy. The forest as a natural resource yielding measurable material forest values and social benefits. Credit, 3.
59. FOREST PROTECTION.—The principles of protecting forests from all harmful agencies. Credit, 3.
66. WOOD ANATOMY AND IDENTIFICATION.—A basic anatomical study of wood elements, their structural characteristics and functions. Relation of structure and properties to use. Practice in identification. Credit, 3.
75. FOREST PRODUCTS.—Manufacture and distribution of forest products. Credit, 3.
76. WOOD TECHNOLOGY.—A comprehensive survey of the structure, composition and properties of wood in relation to its economic utilization including the technological processes for industrial purposes. Credit, 3.
78. HARVESTING OF FOREST PRODUCTS.—Methods of harvesting forest products in the several forest regions of the United States including primary transportation problems. Credit, 3.
85. AIR SEASONING AND KILN DRYING OF WOOD.—Fundamentals, controls, and practices with which the proper seasoning of wood is concerned. Credit, 3.
90. Advanced Dendrology. Credit, 3.

Wildlife Management

COURSES FOR MAJOR OR MINOR CREDIT

101. NORTH AMERICAN ANIMALS.—A review of the taxonomy, life histories, and ecological interrelationships of North American vertebrates. Credit, 3.
102. WILDLIFE ADMINISTRATION.—A study of the organization and operation of state and federal agencies concerned with wildlife management. Credit, 3.

103. CONSERVATION OF NATURAL RESOURCES.—A survey of natural resources in relation to national prosperity. Includes soil, water, forests, grasslands, wildlife and minerals. Credit, 3

150. MANAGEMENT OF WILD ANIMALS.—A study of the factors which influence wild animal abundance. Credit, 3

180, 181. SPECIAL PROBLEMS. Credit, 3 each semester

200. THESIS. Credit, 10

COURSES FOR MINOR CREDIT ONLY

70. GAME BIRDS AND MAMMALS.—Life history, ecology, and methods of management. Credit, 3

71. WATER FOWL AND FURBEARERS.—Life history, ecology, and methods of management. Credit, 3

73. PREDACEOUS BIRDS AND INJURIOUS RODENTS.—Life history, ecology, management, and control. Credit, 3

74. TECHNIQUES OF MANAGEMENT.—Includes cover mapping, census, habitat studies, and food habits. Credit, 3

Geology and Mineralogy

L. R. WILSON in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101. OPTICAL MINERALOGY.—An introduction to the theory, procedure and technique involved in the study of minerals by means of the petrographic microscope. The laboratory work will include the preparation of thin sections of minerals and rocks, together with a study of their optical properties by means of polarized light. Given in alternate years. 1950-51. Credit, 3

Assistant Professor NELSON

112. SEDIMENTATION.—A course dealing with the sources, deposition, modifying conditions, structures and environmental relationships of sediments and their consolidated equivalents. The field and laboratory study includes the collection and preparation of samples, together with their analyses. Given in alternate years. 1949-50. Credit, 3

Assistant Professor NELSON

113. STRUCTURAL GEOLOGY.—A study of the origin of rock structures, their occurrence, and recognition. Given in alternate years. 1949-50. Credit, 3

Professor WILSON

121. MICROPALAEONTOLOGY.—Principles of micropalaeontology with emphasis on the use of foraminifera ostracods, plant spores and pollen in stratigraphic investigations. Given in alternate years. 1950-51. Credit, 3

Professor WILSON

132. PRINCIPLES OF STRATIGRAPHY.—A study of the principles of stratigraphic correlation as related to the major rock units of the United States. Given in alternate years. 1950-51. Credit, 3

Professor WILSON

141. SEMINAR.—Review of current literature or discussion of selected topics. Credit, 1

THE DEPARTMENT

200. THESIS.—Research on an approved problem. Credit, 10.
THE DEPARTMENT.

COURSES FOR MINOR CREDIT ONLY

51. MINERALOGY. Credit, 3.
52. PETROLOGY. Credit, 3.
61. PHYSIOGRAPHY AND REGIONAL GEOLOGY.—Eastern United States.
Credit, 3.
62. PHYSIOGRAPHY AND REGIONAL GEOLOGY.—Western United States.
Credit, 3.
63. INVERTEBRATE PALEONTOLOGY. Credit, 3.
64. PLANT PALEONTOLOGY. Credit, 3.

German

COURSES FOR MINOR CREDIT ONLY

Any of the following courses as described and listed by number in the general College Catalogue may be selected to contribute to the requirements for a minor under any major where offerings in the Department of German are approved for a minor:

All courses from No. 51 to No. 82 inclusive.

History

COURSES FOR MINOR CREDIT ONLY

53. INTERNATIONAL RELATIONS.—A course dealing with the development and practices of international relations, the diplomatic and consular services of states, the nature of nationalism and imperialism, the basic factors determining a nation's foreign policy, and the earlier evolution toward supra-national government. Credit, 3.

Assistant Professor PIERCE.

54. THE FAR EAST IN MODERN TIMES.—After a brief and selective survey of earlier Oriental history and culture the emphasis is upon India, China, and Japan since the impact of Western technology. Considerable attention is paid to contemporary political, economic, and diplomatic problems. Given in alternate years. 1950-51. Credit, 3.

Assistant Professor PIERCE.

56. THE HISTORY OF MODERN RUSSIA.—This course is a study of Russia in both Europe and Asia since 1800. The major topics considered are: Tsarist government and society; diplomacy and expansion; political, intellectual, and economic unrest; reforms and the Duma; World War I and the Communist Revolution; recognition and experimentation; World War II; the U.S.S.R. as an Eurasian World Power. Given in alternate years. 1949-50. Credit, 3.

Assistant Professor PIERCE.

57, 58. HISPANIC-AMERICAN HISTORY.—A general course in the history and civilization of the Americas south of the United States. The first semester deals with the periods of exploration, organization, and revolution to 1824; the second

semester, with the period of national independence and growth from 1824 to the present. Either semester may be elected independently. Credit, 3 each semester.

Assistant Professor PIERCE.

59. HISTORY OF THE UNITED STATES SINCE 1763-1865.—The development of American democracy, with emphasis upon the political story interpreted in the light of basic social, economic, intellectual and spiritual factors. Credit, 3.

Professor CARY.

60. HISTORY OF THE UNITED STATES SINCE 1865.—Continuation of History 59. Credit, 3.

Professor CARY.

61. ANCIENT CIVILIZATIONS.—The Ancient Near East and Greece. Given in alternate years. 1950-51. Credit, 3.

Assistant Professor DAVIS.

63. ANCIENT ROMAN HISTORY.—Given in alternate years. 1949-50. Credit, 3.

Assistant Professor DAVIS.

65. NINETEENTH AND TWENTIETH CENTURY ENGLAND.—Victorian society and ideals; Industrial Revolution and its effect; growth of democracy. Emphasis on social conditions and thought movements. Given in alternate years. 1949-50. Credit, 3.

Prerequisite, History 31 or 32.

Professor CALDWELL.

67. STUART ENGLAND.—The struggle between Crown and Parliament is treated in detail. Emphasis is also placed on social, religious, and intellectual aspects of English life in the period. Wide reading in contemporary sources. Given in alternate years. 1950-51. Credit, 3.

Prerequisite, History 31 or 32.

Professor CALDWELL.

69. EUROPE. 1870-1918.—Internal developments of the principal countries, including political and economic changes, social unrest, and intellectual currents; the development of imperialism; a detailed study of conditions and diplomacy which led to the World War; military history of the War. Credit, 3.

Professor CALDWELL.

70. EUROPE SINCE 1918.—A continuation of History 69, but may be elected independently. Approximately half of the course is devoted to international affairs, including the Peace Settlement, the development of German, Italian and Japanese aggression, and World War II. The other half of the course is a study of internal developments in the principal European nations. Credit, 3.

Professor CALDWELL.

75. MEDIEVAL EUROPE.—Europe from the barbarian invasions to the Renaissance. Social and economic conditions, development of national monarchies, the Church and religion; medieval culture. Credit, 3.

MR. ZEENDER.

76. THE HISTORY OF THE RENAISSANCE.—The later Middle Ages. The Church at the height of power. The rise of nationalities. The Italian towns. The New Learning and its relation to Art, Science, Invention, Geographical Discoveries. Spread and effects of the Renaissance. Credit, 3.

MR. ZEENDER.

81. DIPLOMATIC HISTORY OF THE UNITED STATES 1776-1900.—The history of American foreign policy and its basic factors to the end of the nineteenth century. Credit, 3.

Professor CARY.

82. **DIPLOMATIC HISTORY OF THE UNITED STATES SINCE 1900.**—The history of the United States as a world power. Credit, 3.

Professor CARY.

91. **HISTORICAL BIBLIOGRAPHY.**—Open to graduate students approved by the department. The student will be expected to know the principal secondary works and some of the more important source collections in various fields of history. Training in the assembling of a bibliography on special topics.

Credit, 1.

THE DEPARTMENT.

92. **SEMINAR.**—Open to graduate students approved by the department. Principles of historical criticism and research. Papers on assigned topics.

Credit, 1.

THE DEPARTMENT.

Home Economics

HELEN S. MITCHELL in Charge

Through the proper selection of courses under this major, students may prepare themselves for special service in the fields of human nutrition, home economics education, and public health.

COURSES FOR MAJOR OR MINOR CREDIT

101, 102. **PROBLEMS IN FOODS AND NUTRITION.**—Depending on the interest and training of the individual student, research problems may be selected from such fields as vitamin, mineral, and protein metabolism of man or small animals; effect of methods of cookery on nutritive value of foods; basal metabolism; child feeding; relation of food to health. Opportunity is provided for experience in a variety of techniques, e.g., chemical, biological, and bacteriological methods of food analysis, metabolic studies, and dietary surveys. Credit, 5 each semester.

103. **ADVANCED NUTRITION—METABOLISM OF THE MAJOR FOODSTUFFS.**—A study is made of energy metabolism and the metabolism of carbohydrates, fats, proteins, and related substances, their role in human nutrition, and physiological effects of dietary inadequacies. A critical evaluation of food value tables and other reference material is made. Students are expected to give special reports from current literature supplementing class discussion. Credit, 3.

Prerequisites, Physiological Chemistry and Physiology.

104. **ADVANCED NUTRITION—MINERALS AND VITAMINS.**—A detailed study is made of mineral metabolism, function in the body and the result of deficiencies. The vitamins will be discussed from the standpoint of food distribution, function, chemical nature and stability, assay methods, and result of deficiencies.

Credit, 3.

111, 112. **NUTRITION SEMINAR.**—Readings, discussions and preparation of bibliographies on nutrition problems of current interest. Credit, 1 each semester.

181. **METHODS OF TEACHING HOME ECONOMICS.**—A study is made of general education philosophy; the application of home economics to the entire school program; development of curricula based upon student needs; exploration of instructional methods and techniques. This course gives credit toward meeting state standards for teachers. During the last month a two-hour laboratory period replaces one lecture. Credit, 3.

187. **PRINCIPLES AND PRACTICES OF TAILORING.**—Emphasis is placed on handling of wool in the making of suits and coats.

One class hour; two 2-hour laboratory periods.

Credit, 3.

Prerequisites, Home Economics 61 or its equivalent.

188. **APPLIED DRESS DESIGN.**—Costume design is studied by means of drawing and draping, using textures of unusual nature. Emphasis will be placed on fitting and adapting design to the figure. Credit, 3.
Three 2-hour laboratories.

Prerequisite, Home Economics 187 or its equivalent.

189. **DIET THERAPY.**—The application of nutrition principles to diet in disease. Recent theories of dietary treatment of gastro-intestinal disorders obesity, anemia, fevers, diabetes, food allergy, cardiovascular and biliary tract diseases are reviewed critically. Students are required to use and be familiar with current medical literature as it applies to nutritional problems in disease and at the same time openminded regarding new developments in this field. Scientific and medical terminology is emphasized. Credit, 3.

Prerequisites, Home Economics 52 or 103 and 104; Physiological Chemistry; Physiology.

193. **EXPERIMENTAL FOODS.**—The testing and comparing of different food materials and methods of preparation, including advanced work in the science and techniques of cookery. Special individual problems will be studied. The course is helpful to those interested in commercial food testing and valuable to those wishing to develop a scientific approach to the study of foods. Credit, 3.

One class hour; two 2-hour laboratory periods.

Prerequisites, Home Economics 30 and 51; Chemistry 31 and 32, or equivalent, and permission of the instructor.

200. **THESIS.**—Individual research in the field of nutrition and the preparation of an acceptable thesis reporting results and analysis of such studies. Special emphasis given to the requirement for, and utilization of, various nutrients by man and small animals. Credit, 10.

THE DEPARTMENT.

COURSES FOR MINOR CREDIT ONLY

52. **NUTRITION AND DIETETICS.**—A study is made of the fundamentals of normal nutrition including energy needs, the metabolism of proteins, carbohydrates, fats, vitamins, and minerals; and the quantitative requirements for these various essential nutrients. Laboratory work provides the further study of the composition of foods and their contribution to the diet and the relationship of the nutritive value to cost. Nutritive loss due to cooking, storage, etc., is given consideration. Credit, 3.

Three class hours, one 2-hour laboratory period.

Prerequisites, Home Economics 30, Chemistry 31 and 32 or Physiology 32.

75. **ECONOMICS OF THE HOUSEHOLD.**—A study is made of personal and family standards of living in the modern home, the economic relations of the household, and the use of time, energy, and money as a means to influence the home situation. Credit, 3.

80. **FAMILY LIFE.**—A study is made of the modern family; ideals and responsibilities of the home and the individual's share in developing positive family relationships. Credit, 3.

84. **PROBLEMS IN HOME ECONOMICS.**—By arrangement with the Major Adviser. An intensive application of home economics to special problems. Two class hours; one 2-hour laboratory period. Credit, 3.

86. **CHILD DEVELOPMENT.**—The growth and development of the child, the care of children at various ages, treatment in behavior problems, and the influence of environment in shaping personality are studied. The Nursery School provides a laboratory for this course. Credit, 3.

91, 92. INSTITUTIONAL FOODS AND MANAGEMENT.—A study is made of the principles of organization, personnel management, the administration, food costs, operating expenses, and the special functions of the dietitian. Laboratory work is planned at the College Dining Hall and dormitories. It is expected that students will enroll for the work of both semesters. Students wishing to qualify for administrative institutional work are advised to take Economics 81.

Credit, 3 each semester.

First semester, one class hour; one 4-hour laboratory period.

Second semester, two class hours; one 2-hour laboratory period.

Prerequisite, Home Economics 51 and 52.

95. CHILD DEVELOPMENT.—The growth and development of the child, his basic needs, the aspects of behavior—routine, creative and social—as they are related to personality development. Planned observation and participation in the Nursery School.

Credit, 3.

Three class hours; laboratory by arrangement.

Landscape Architecture

RAYMOND H. OTTO in Charge

COURSES FOR MAJOR OR MINOR CREDIT

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|---|--|
| 175. ART APPRECIATION. | Credit, 3.
Professor OTTO. |
| 176. CIVIC ART.—Studies in problems in civic art, including city planning, country planning and subdivision, public policies, and administration in park and forest recreation, and landscape conservation. | Credit, 3.
Professor OTTO. |
| 177. HISTORY OF ART. | Credit, 3.
Professor ROBERTSON. |
| 178. HISTORY OF ART. | Credit, 3.
Professor ROBERTSON. |
| 179. CONSTRUCTION AND MAINTENANCE. | Credit, 3.
Professor BLUNDELL. |
| 181, 182. ADVANCED DESIGN. | Credit, 3 each semester.
MR. DURRELL. |
| 183. HISTORY OF ARCHITECTURE. | Credit, 3.
Professor ROBERTSON. |
| 190. THEORY.—Special studies in the history and theory of art and of landscape architecture. | Credit, 3.
THE DEPARTMENT. |
| 191. DESIGN.—Individual problems in any or all branches of design, including estates, parks, playgrounds, public grounds, etc. | Credit, 3.
THE DEPARTMENT. |
| 192. CONSTRUCTION.—Individual problems by arrangement, including engineering, estimating, cost accounting, and methods of construction. | Credit, 3.
THE DEPARTMENT. |

194. PRACTICE.—Professional field work under supervision, conducted upon going projects as opportunity offers. Credit, 3

By arrangement
THE DEPARTMENT

196. PRESENTATION.—Studies in drafting, pen and crayon, rendering, water coloring, etc. Credit, 3

Professor ROBERTSON

197. ARCHITECTURE.—Problems in architecture. Credit, 3

Professor ROBERTSON

200. THESIS. Credit, 10

COURSES FOR MINOR CREDIT ONLY

51. MAPPING AND TOPOGRAPHY. Credit, 3

52. ELEMENTS OF LANDSCAPE ARCHITECTURE.—Engineering details, grades roads, drainage. Credit, 3

53. GARDEN DESIGN.—Historical styles and fundamental principles of composition. Credit, 3

Professor OTTO

54. GENERAL DESIGN.—A series of problems in the design of small properties estates and parks. Credit, 3

Professor OTTO

FOR THE DEGREE OF BACHELOR OF LANDSCAPE ARCHITECTURE

To receive the degree of Bachelor of Landscape Architecture each candidate will be required:

1. To have received the degree of Bachelor of Science or Bachelor of Art from a reputable institution.

2. To have completed as a prerequisite 24 semester credits in technique courses in landscape architecture, substantially equivalent to the technical course now required in the major in landscape architecture at this college.

3. In addition, to have completed in residence at this institution 30 credit in landscape architecture and closely related subjects prescribed by the department. (See Fifth Year Program below.)

4. To have maintained a standing of 70 or better in all courses of the Fifth Year.

5. To have received the unanimous approval of the faculty of the department and the usual vote of approval of the faculty of the Graduate School.

FIFTH YEAR PROGRAM

The regular program of studies for the Fifth Year, subject to minor change dependent upon courses taken previously, is as follows.

First Semester.

LANDSCAPE ARCHITECTURE 101. General Design. Professor OTTO

LANDSCAPE ARCHITECTURE 103. Ecology. Professor BLUNDEL

- LANDSCAPE ARCHITECTURE 107. Contracts, Specifications, Estimates, Costs.
Mr. DURRELL.
- LANDSCAPE ARCHITECTURE 109. Landscape Sketching. (Elective)
Mr. MACIVER.
- ARCHITECTURE 101. Elementary Problems.
Professor ROBERTSON.
- Elective.

Second Semester.

- LANDSCAPE ARCHITECTURE 102. General Design.
Professor OTTO.
- LANDSCAPE ARCHITECTURE 106. Landscape Forestry.
Professor HOLDSWORTH.
- LANDSCAPE ARCHITECTURE 110. Architectural Sketching. (Elective)
Mr. MACIVER.
- LANDSCAPE ARCHITECTURE 112. Professional Practice.
Professor OTTO.

Mathematics

COURSES FOR MINOR CREDIT ONLY

55. MATHEMATICS OF FINANCE.—The mathematical principle of simple and compound interest; annuities, depreciation, valuation of bonds, insurance, building and loan associations. The development and application of aids to computation in problems arising from financial transactions. Credit, 3.

Prerequisite, Math. 8 or 10. Assistant Professor BOUTELLE.

60. SPHERICAL TRIGONOMETRY AND SOLID ANALYTICAL GEOMETRY.—The trigonometry of the sphere with applications to terrestrial and celestial problems. This is followed by a study of higher plane curves and the analytic representation of points, lines and surfaces in space. Given in alternate years. 1949-50. Credit, 3.

Assistant Professor BOUTELLE.

62. STATISTICS.—The fundamental mathematical principles of statistical analysis. A discussion of averages, measures of dispersion, frequency and probability functions, correlation, random sampling. This course in conjunction with Agricultural Economics 79 should provide the student with a good understanding of the application of statistical method and the interpretation of results.

Prerequisite, Math. 30. Credit, 3.

Assistant Professor BOUTELLE.

65. THEORY OF EQUATIONS.—An introduction to advanced algebra. A discussion of the conditions for and methods of solving algebraic and transcendental equations; ruler and compass construction; systems of equations; determinants and matrices; symmetric functions; resultants; discriminants; invariants; the fundamental theorem of algebra. Given in alternate years. 1949-50. Credit, 3.

Prerequisite, Math. 29 or by arrangement. Assistant Professor BOUTELLE.

66. INTRODUCTION TO HIGHER GEOMETRY.—A study of various methods employed in the modern treatment of geometry of points, lines, and conics. Such topics as homogeneous point and line coordinates; infinite elements; harmonic division; groups of transformations and their invariants; and the elements of projective and other geometries will be considered. Given in alternate years. 1949-50. Credit, 3.

Prerequisite, Math. 3 or 4. Professor ANDERSEN.

71. VECTOR ANALYSIS.—The algebra and calculus of vectors. Applications to physics and other fields will be considered. Given in alternate years. 1950-51.

Credit, 3.

Professor ANDERSEN.

72. HISTORY OF MATHEMATICS.—A study of the great agencies which have developed progress in mathematics. Desirable for students planning to teach mathematics. Given in alternate years. 1950-51.

Credit, 3.

Prerequisite, Math. 30.

Assistant Professor ROSE.

91, 92. ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS.—A course devoted to the topics of the calculus more advanced than those encountered in Mathematics 29 and 30 such as series, expansion of functions, envelopes, partial differentiation, and multiple integrals. This work is followed by a study of differential equations, a subject which dominates the field of applied mathematics.

Prerequisite, Math. 30.

Credit, 3.

THE DEPARTMENT.

94. ADVANCED CALCULUS.—A continuation of Mathematics 91. Line and surface integrals, Taylor's expansion, Fourier's series, calculus of variations, Gamma and Beta Functions.

Credit, 3.

Prerequisite, Math. 91.

THE DEPARTMENT.

Olericulture

GRANT B. SNYDER in Charge

COURSES FOR MAJOR OR MINOR CREDIT

150. CURRENT LITERATURE.—A review of scientific papers relating to research work in Olericulture as affecting various cultural practices both in the greenhouse and in the field.

Credit, 3.

THE DEPARTMENT.

151. NUTRITION OF VEGETABLE CROPS.—Readings, laboratory and greenhouse work related to problems of soil management and fertilization practices.

Credit, 3.

THE DEPARTMENT.

152. CULTURAL PROBLEMS.—A study of fundamental factors such as soil moisture, light, humidity, and temperature as they influence cultural practices.

Credit, 3.

Professor SNYDER.

175. ADVANCED SYSTEMATIC OLERICULTURE.—A critical study of vegetable types as to nomenclature, identification, and classification.

Credit, 3.

Professor SNYDER.

181. SEMINAR.—A study of research work related to Olericulture. Each student will be required to present papers on assigned readings.

Credit, 1.

Professor SNYDER and the DEPARTMENT.

200. THESIS.—Research on some suitable topic relating to a specific phase of Olericulture.

Credit, 10.

Professor SNYDER and the DEPARTMENT.

COURSES FOR MINOR CREDIT ONLY

25.	GENERAL OLERICULTURE.	Credit, 3.
51, 52.	PRINCIPLES OF OLERICULTURE.	Credit, 3.
73, 74.	MARKETING PRACTICES.	Credit, 3.
75.	SYSTEMATIC OLERICULTURE.	Credit, 3.
76.	GREENHOUSE CROPS.	Credit, 3.
78.	COMMERCIAL OLERICULTURE.	Credit, 3.

Philosophy

COURSES FOR MINOR CREDIT ONLY

61. FUNDAMENTALS OF PHILOSOPHY.—A study of the various types of contemporary philosophy with emphasis upon evaluation and criticism. Credit, 2.
Professor GLICK.
62. HISTORY OF PHILOSOPHY.—A study of the development of Western thought in general from the time of the early Greeks up to the recent past.
Credit, 2.
Professor GLICK.
63. LOGIC.—A study of the structure of thought from the standpoints of gaining and evaluating knowledge. Attention is also given to the clearness of expression and effectiveness of conviction.
Credit, 2.
Professor GLICK.
64. ETHICS.—A critical study of the fundamental ethical theories and practices both historical and contemporary, with an attempt to evaluate each in the light of present knowledge and social practices.
Credit, 2.
Professor GLICK.
65. PHILOSOPHY OF EDUCATION.—A criticism and evaluation of the various theories and practices in education viewed in the light of historical perspective and present-day science and theory.
Credit, 2.
Professor GLICK.

Physical Education

HAROLD M. GORE in Charge

COURSES FOR MAJOR OR MINOR CREDIT

MEN

Major work in Physical Education is prescriptive and courses are arranged in consultation with the Head of the Department. Course selection is dependent upon the following objectives: physical education; health and safety education; athletics and teacher-coaching, or physical recreation.

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| 142. | WATER FRONT PROGRAMS AND AQUATIC RESEARCH. | Credit, 3. |
| | Professor GORE, Assistant Professor ROGERS. | |
| 144. | PHYSICAL EDUCATION TESTS AND MEASUREMENTS. | Credit, 3. |
| | MR. SALWAK. | |
| 145. | PHYSICAL EDUCATION HISTORY AND TRENDS. | Credit, 3. |
| | Professor LORDEN. | |

153. ELEMENTARY SCHOOL PHYSICAL EDUCATION. Credit, 3
Assistant Professor DERBY
154. PHYSICAL EDUCATION.—Special Methods. Credit, 3
Assistant Professor DERBY
156. PHYSICAL EDUCATION ORGANIZATION AND ADMINISTRATION. Credit, 3
Professor HICK
- 171, 172. SPECIAL PROBLEMS IN PHYSICAL EDUCATION.
Credit, 3 each semester
Professor GORE and the DEPARTMENT
173. RECREATION ADMINISTRATION AND ORGANIZATION. Credit, 3
Professor GORE
174. RECREATION LAND USE. Credit, 3
Professor GORE
175. HEALTH AND SAFETY EDUCATION. Credit, 3
Associate Professor KAUFFMAN
176. ANATOMY GENERAL. Credit, 3
Professor RADCLIFFE
178. ANATOMY APPLIED. Credit, 3
Professor RADCLIFFE
190. SEMINAR. Credit, 3 each semester
Professor GORE and the DEPARTMENT
200. THESIS. Credit, 3
Professor GORE and the DEPARTMENT

Physics

COURSES FOR MINOR CREDIT ONLY

51, 52. MAGNETISM, ELECTRICITY, PHOTO-ELECTRICITY, THERMIONICS AND APPLICATIONS.—Course 51 deals largely with direct currents; Course 52 with alternating currents, applications of thermionics, and photo-electricity. The courses are planned to give the student a good training in theory and methods of measurement in the subjects indicated, which are useful in many fields of investigation. Modern methods are stressed and instruments of precision are used. Two class hours; one 2-hour laboratory period. Credit, 3 each semester
Prerequisites, Physics 26 and Mathematics 29 for Course 51; Physics 51 for Course 52. Professor POWER

55, 56. MECHANICS.—Development of the fundamental concepts of classical dynamics with applications to particles and rigid bodies in translation and rotation. One laboratory period may be substituted for one class hour. In arrangement. Credit, 3 each semester
Prerequisite, Physics 26; Mathematics 30. Associate Professor ROSE

60. SOUND AND ACOUSTICS.—A study of the vibrations, vibrating bodies, coupled systems, sound structure, and acoustic properties. The work will include many applications of sound to technical and commercial fields. Credit, 3
Prerequisite, Physics 55 or its equivalent. Associate Professor ALDERMAN

61, 62. **HEAT AND THERMODYNAMICS.**—A study of heat exchanges and energy changes due to heat in systems of matter. The subject material and experimental methods are useful in other branches of science. Given in alternate years. 1949-50. Credit, 3 each semester.

Two class hours; one 2-hour laboratory period. Associate Professor ALDERMAN.

63, 64. **OPTICS.**—An intermediate course in the theory of light. Work in geometrical and physical optics is done. Precision instruments are used in the laboratory. Given in alternate years. 1950-51. Credit, 3 each semester.

Two class hours; one 2-hour laboratory period. Associate Professor ALDERMAN. Laboratory hours by arrangement.

75, 76. **ADVANCED EXPERIMENTAL WORK IN SELECTED TOPICS.**—These courses are largely experimental and the subject matter is adapted to the needs of the individual student. The research viewpoint is emphasized. The class hour is used for a course in precision of measurements. Credit, 3 each semester.

One class hour; two 2-hour laboratory periods. Professor POWERS.

Prerequisites, Physics 51, 52 or 55, 56 or 63, 64; Mathematics 29 and 30.

85, 86. **MODERN PHYSICS.**—Typical subjects studied are theories of the atom, radiation, quantum theory; spectra, X-ray analysis, nuclear reactions. Given in alternate years. 1949-50. Credit, 3 each semester.

Prerequisites, Physics 51, 62 and 64 or equivalent; Mathematics 29 and 30.

Professor POWERS.

95, 96. **ELECTRONICS.**—Given in alternate years. 1950-51.

Prerequisites, Physics 51, 52; Mathematics 29, 30. Credit, 3 each semester.

Professor POWERS.

Pomology

A. P. FRENCH in Charge

COURSES FOR MAJOR OR MINOR CREDIT

102. **POMOLOGICAL RESEARCH.**—A critical study of methods and interpretation of results of past and current research work in pomology. Such topics as the following may be selected:

1. Orchard soils and soil management.
2. Pruning of fruit plants.
3. Nutrition of fruit plants.
4. Plant hormones.
5. Fruit bud differentiation.
6. The setting, growth, and ripening of fruits.
7. The genetics and breeding of fruit plants.
8. Climatology, winter injury, and hardiness.
9. Propagation of fruit plants.
10. Pest control on fruit plants.
11. Fruit storage.

Maximum credit per topic 3.

103. **ADVANCED LABORATORY WORK.**—Each student will be required to become familiar with the research work of the department and to have a share in it. So far as this has value as graduate work, he will receive credit.

Credit, 5.

104. HISTORY OF POMOLOGY.—The men, institutions, and other influences that have contributed to the development of the science and art of pomology.

Credit, 1

105. ADVANCED SYSTEMATIC POMOLOGY.—An intensive study of leaf and general tree characters of nursery and orchard trees with reference to identification and the relationship of varieties. This work should be undertaken in summer.

Credit, 1

151. PLANT GENETICS.—A study of the principles of genetics with emphasis on their application to plants.

Credit, 1

Professor FRENCH

152. ADVANCED PLANT BREEDING.—An advanced study of genetic topics peculiar to plants, also the methods and problems of the plant breeder. Laboratory work in genetic analysis and the breeding of plants.

Credit, 1

Two class hours, one 2-hour laboratory period.

Professor FRENCH

181. SPECIAL PROBLEMS.—Qualified students may carry on advanced study on special topics or undertake such original investigation as time and available material will permit.

Credit, 2 each semester

Hours by arrangement.

Professor FRENCH

182. PLANT CYTOLOGICAL TECHNIQUE.—The methods of cytology useful to the plant geneticist.

Credit, 1

Two 2-hour laboratory periods.

Professor FRENCH

200. THESIS.—Each student will be required to carry out an original investigation of an assigned problem. In planning, executing and interpreting the data of this problem he must show marked ability. The results are embodied in a thesis to be passed upon by the Department and the Graduate Staff.

Credit, 1

COURSES FOR MINOR CREDIT ONLY

26. SMALL FRUITS.—A study of the growing of raspberries, blackberries, strawberries, currants, blueberries, and grapes, dealing with such questions as varieties, selecting a site for the plantation, soils, fertilizers, pruning, harvesting and marketing.

Credit, 1

Two class hours, one 2-hour laboratory period.

53. GENERAL POMOLOGY.—A study of the most improved practices in fruit production including such questions as the selection of orchard sites and soil laying out and setting the orchard, the structure and growth of fruit plants, the bearing habits, pruning and training of fruits, fertilizers, pollination, and winter injury.

Credit, 1

Two class hours, one 2-hour laboratory period.

56. SPRAYING.—(a) Spraying materials, their composition, manufacture, and preparation for use; the desirable and undesirable qualities of each material; formulas used, costs, and tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used with the important considerations for spraying each fruit and combating each orchard pest. This course is designed especially to familiarize the student with the details of pest control in the orchard.

Credit, 1

Two class hours; one 2-hour laboratory period.

75. **SYSTEMATIC POMOLOGY.**—A study of the more important kinds and varieties of fruits grown in the United States, their relationships and nomenclature. Particular emphasis is placed on the identification, classification and value of varieties, including a study of the characters of the plant as well as the fruit. Given in alternate years. Credit, 4.

one class hour; three 2-hour periods.

77. **COMMERCIAL POMOLOGY.**—The picking, handling, storing, and marketing of fruits, including a discussion of storage houses, fruit packages, and methods of refrigeration, grading and packing. This course also considers the leading American and foreign centers of fruit production as they affect our own fruit industry through competition here and abroad. Given in alternate years.

two class hours; one 2-hour laboratory period.

Credit, 3.

81, 82. **ADVANCED POMOLOGY.**—A consideration of the scientific principles governing the growth and behavior of fruit-bearing plants.

Special attention is given to a critical survey of the more important research work in the field of Pomology. Credit, 3 each semester.

two class hours; one 2-hour laboratory period.

prerequisite, Pomology 53.

83. **SEMINAR.**—Advanced study of problems relating to fruit production. The seminar involves the entire department as well as all advanced students. Each member is assigned subjects for frequent reports. Subject matter is never repeated and graduate students are expected to take part in the seminar throughout the entire period of residence.

one class hour.

Credit, 1 each semester.

Poultry Science

F. P. JEFFREY in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101. **SCIENCE OF POULTRY HUSBANDRY.**—A review of the entire field of poultry literature, including books, bulletins, journals and other technical publications to furnish a comprehensive background of the present status of knowledge in poultry science. Written reports will be required. Credit, 3.

102. **POULTRY RESEARCH PROBLEMS.**—A critical review of research, experimentation, and demonstration that has been carried out by workers at the various stations in this and other countries. A study of poultry problems in foreign countries together with the outstanding needs in the United States with a view to discovering the needs for fundamental research. Credit, 3.

103, 104. **ADVANCED GENETICS.**—A lecture course offered during both semesters dealing with the experimental study of genetics in relation to both plant and animal breeding. The course is open to qualified graduate students in any line of study. Credit, 3 each semester.

105. **GENETICS AND EVOLUTION.**—A series of lectures dealing with the genetics of evolution. The course is designed to follow Course 103-104 and to stress the relation of evolution to genetics. The course is open to all qualified graduate students. Credit, 3.

106. **RESEARCH IN BREEDING.**—Students may carry on definite experiments in poultry breeding. All research work will be confined to the field of pure and applied genetics. Problems concerned with both physical and physiological characters may be studied. Credit, 5.

107. **INTERPRETATION OF EXPERIMENTAL DATA.**—This course includes a statistical analysis of experimental data in various phases of research work. Attention is given to the application of the more important statistical treatments in making interpretation of experimental results in breeding, nutrition, and other fields. Credit, 3.

108. **AVIAN BEHAVIOR.**—This course is designed as a study in avian behavior to determine the nature and persistency of the order of dominance in the domestic fowl and to relate these to certain physiological reactions. Credit, 2.

Professor SANCTUARY.

109. **AVIAN GENETICS.**—This course is concerned entirely with Class Aves. It is the aim to cover the genetics of different types of birds as well as the domestic fowl in a series of lectures. Genetics 103 and 104 are required as prerequisites. Credit, 3.

110. **METHODS OF RESEARCH IN POULTRY SCIENCE.**—This course is designed to consider different methods of research in poultry science with the advantages and disadvantages of each. Attempts will be made to develop more constructive and exact methods of procedure. Credit, 2.

200. **THESIS.**—Research work may be carried out only in breeding. Originality and thoroughness are particularly emphasized. Credit, 10.

COURSES FOR MINOR CREDIT ONLY

78. **SEMINAR.**

Credit, 3-4.

Professor JEFFREY.

Psychology

CLAUDE C. NEET in Charge

COURSES FOR MAJOR OR MINOR CREDIT

151. **EXPERIMENTAL PSYCHOLOGY.**—A survey of important experiments in psychology. Special attention is given to experimental design, specific techniques of experimentation, and to apparatus employed. Credit, 3.

Professor NEET.

152. **PHYSIOLOGICAL PSYCHOLOGY.**—A study of the physiological correlates of behavior. Special attention is given to sensory, motor, and association processes. Credit, 3.

Assistant Professor FELDMAN.

155. **EDUCATIONAL PSYCHOLOGY.**—Theoretical and educational aspects of the following topics will be studied: measurement, physical and mental growth, learning, mental hygiene, counseling and vocational guidance. Credit, 3.

Assistant Professor VALLANCE.

163. **SOCIAL PSYCHOLOGY.**—A theoretical orientation to the study of the phenomena of social living. Emphasis will be on theories of social behavior, methods and concepts with which these theories treat traditional and current topics, and interpretation and criticism of research literature. Credit, 3.

Assistant Professor VALLANCE.

177. **NEURAL CORRELATES OF BEHAVIOR.**—A detailed study of the neuroanatomical relationships of sensory-motor systems. Emphasis is placed upon the major fiber systems and their role in behavior. Credit, 3.

Assistant Professor FELDMAN.

182. **INDIVIDUAL INTELLIGENCE TESTING.**—The nature and theories of intelligence are considered. This is followed by a critical evaluation of individual type intelligence tests. Practice in administration, scoring and interpretation of the most important tests is given in the laboratory.

Credit, 3.

Miss PHILLIPS.

184. **INDIVIDUAL INTELLIGENCE TESTING.**—The etiology, symptoms, and therapy of behavior abnormalities are studied. Some of the disorders dealt with are speech abnormalities, emotional extremes, the seizure states, feeble-mindedness, and the neuroses and psychoses.

Credit, 3.

Professor NEET.

186. **INDUSTRIAL AND BUSINESS PSYCHOLOGY.**—The course aims toward an understanding of principles, techniques, and methods in the study of the following problems of business and industry: employee selection and evaluation, employee training and motivation, conditions of work, accidents, and fatigue.

Credit, 3.

Assistant Professor VALLANCE.

188. **PSYCHOLOGY OF GUIDANCE.**—A study and evaluation of psychological principles, tests and procedures involved in different types of guidance.

Credit, 3.

Miss PHILLIPS.

190. **CONTEMPORARY THEORIES OF PSYCHOLOGY.**—This course deals with the history and theories of psychology. Each of the major theories or schools is discussed and evaluated.

Credit, 3.

Dr. Goss.

191. **CHILD PSYCHOLOGY.**—A study of child and adolescent behavior. Principles of behavior development, habit formation, emotion, motivation, interests, and personality adjustment are stressed.

Credit, 3.

Professor NEET.

192. **CLINICAL PSYCHOLOGY.**—A consideration of the techniques and methods involved in the diagnosis and therapy of behavior disorders. Clinical testing, counseling, and psychotherapy are major topics of the course.

Credit, 3.

Assistant Professor FELDMAN.

193. **CLINICAL PRACTICE.**—Supervised practice will be given in diagnostic and therapeutic procedures used in clinical psychology.

Credit, 3.

Professor —————.

194. **MENTAL HYGIENE.**—A study of the development of personality habits and individual mental health. Some of the topics treated are: origin of behavior, factors of learning in adjustment, emotional control, behavior problems, the neuroses, and the applications of mental hygiene.

Credit, 3.

Professor NEET.

195. **PROBLEMS IN PSYCHOLOGY.**—Affords an opportunity for study in any special field of psychology not considered in other courses.

Credit, 2.

THE DEPARTMENT.

196. **STATISTICS IN PSYCHOLOGY.**—A study of statistical procedures applicable to the analysis of psychological problems and data.

Credit, 3.

Mr. Goss.

200. **THESIS.**

Credit, 10.

THE DEPARTMENT.

Romance Languages

CHARLES F. FRAKER in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101, 102. AN INTRODUCTION TO ROMANCE PHILOLOGY.—Studies in the law of vowel and consonantal change; the provenience of words. Given in alternate years. 1949-50.

Credit, 3 each semester

Professor FRAKE

103, 104. OLD FRENCH READINGS.—Early monuments of French Literature the Arthurian and Carolingian Cycles. Given in alternate years. 1950-51.

Credit, 3 each semester

Professors FRAKER and GODIN

105, 106. OLD SPANISH READINGS.—Early monuments of Spanish Literature The *Cronicas* and the *Poema del mio Cid*. Given in alternate years. 1950-51.

Credit, 3 each semester

Professor FRAKE

107, 108. THE RENAISSANCE, RABELAIS, MONTAIGNE AND OTHERS.—Given in alternate years. 1949-50.

Credit, 3 each semester

Professor GODIN

109, 110. CONTEMPORARY FRENCH LITERATURE.—Given in alternate years. 1949-50.

Credit, 3 each semester

Assistant Professor CLARK

111, 112. FRENCH LITERATURE OF THE EIGHTEENTH CENTURY.—Given in alternate years. 1949-50.

Credit, 3 each semester

Professor GODIN

121, 122. PROBLEM COURSE.—Independent study of some phase of linguistic or literature.

Credit, 3 each semester

THE DEPARTMENT

129, 130. FRENCH CLASSICISM.—A survey of the Classic period, with readings from representative works.

Credit, 3 each semester

Prerequisites, French 7 and 8 or their equivalent.

Professor FRAKE

131. FRENCH ROMANTICISM.—A detailed study of the Romantic period. Conducted in French.

Credit, 3

Prerequisites, French 7 and 8, or their equivalent.

Professor GODIN

132. FRENCH REALISM.—A detailed study of the Realistic period and the modern writers. Conducted in French.

Credit, 3

Prerequisite, French 31.

Professor GODIN

171. VOLTAIRE.—A study of the eighteenth century through the life and work of Voltaire.

Credit, 3

Prerequisites, French 7 and 8 or their equivalent.

Professor FRAKE

172. FRENCH LYRIC POETRY.—A study of the French lyric poets, including excerpts in modern translation from the Middle Ages and from the various modern improvements through the nineteenth century. Collateral readings and reports.

Credit, 3

Prerequisites, French 7 and 8 or their equivalent.

Professor FRAKE

180. **ADVANCED GRAMMAR AND COMPOSITION.**—A thorough review of grammar, pronunciation, and the phonetic method. Credit, 3.
Professor GODING.
181. **SPANISH ROMANTICISM.**—Readings from representative authors; written and oral composition. Credit, 3.
Prerequisites, Spanish 7 and 8. Professor FRAKER.
182. **THE SPANISH MODERNISTS.**—Dario, Nervo and their contemporaries; composition and conversation. Credit, 3.
Prerequisites, Spanish 7, 8, and 29. Professor FRAKER.
- 183, 184. **THE GOLDEN AGE.**—Readings from Cervantes, Lope de Vega, Calderon, Garcilasco and others. Composition and conversation. Credit, 3 each semester.
Prerequisites, Spanish 7 and 8. Professor FRAKER.
200. **THESIS.** Credit, 10.

Sociology

COURSES FOR MINOR CREDIT ONLY

51. **URBAN SOCIOLOGY.**—A comparative study of modern social conditions, social agencies, and methods of adjustment, with special reference to the city environment. Characteristics of the population, urban ecology, and problems of adjustment in the fields of housing, health, education, and recreation. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. Mr. MANFREDI.
52. **RURAL SOCIOLOGY.**—A systematic study of rural society from the standpoint of its population, institutions, standards of living, and their relation to urban society. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. Professor KORSON.
53. **CULTURAL ANTHROPOLOGY.**—A cultural study of pre-literate and literate man, with particular reference to the development of social institutions. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. Mr. MANFREDI.
54. **AMERICAN RACE RELATIONS.**—The social, economic and political aspects of racial problems in the United States, with particular reference to the Negro and major ethnic groups. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. Professor KORSON.
57. **THE FAMILY.**—The history and development of the customs of courtship and marriage from primitive society to the American family. The basic causes of changes and trends of the family are considered. The folkways and mores of marriage in other societies are also studied. Credit, 3.
Professor KORSON.
61. **POPULATION PROBLEMS.**—An analytical study of population trends and problems of the world. In greater detail: the origin, composition, growth, migration, and urbanization of the American population. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. Mr. DRIVER.
76. **INTRODUCTION TO SOCIAL WELFARE.**—Contemporary problems of social concern; causes of poverty; methods of caring for adult and child dependents and defectives. A consideration of public and private agency administration and techniques, and an examination of federal, state and local community programs. Credit, 3.
Prerequisites, Sociology 28 or its equivalent; 51, 75. Mr. DRIVER.

78. **CRIMINOLOGY.**—A study of the nature of crime and the factors underlying criminal behavior. Attention is also given to the machinery of justice in criminal behavior: the law, the courts, police enforcement, penal and correctional institutions. MR. DRIVER.

79, 80. **SEMINAR.**—Devoted to special problems in the field of sociology, and based on reports of student research. Credit, 3.
Prerequisite, Sociology 28 or its equivalent. THE DEPARTMENT.

82. **SOCIOLOGICAL THEORY.**—An examination of the contributions of European and American writers who have concerned themselves with theories of the origin, growth, and development of human social organization. Credit, 3.
Prerequisites, Sociology 28 or its equivalent; 53. MR. MANFREDI.

Veterinary Science

COURSES FOR MINOR CREDIT ONLY

75. **COMPARATIVE VETERINARY ANATOMY.**—The structures of the horse, cow, sheep, and pig are studied. Credit, 3.
Three lectures a week.

76. **GENERAL VETERINARY PATHOLOGY.**—The principles of pathology and their application as related to diseases of domesticated animals are considered. Credit, 3.
Three lectures a week.

Zoology

GILBERT L. WOODSIDE in Charge

COURSES FOR MAJOR OR MINOR CREDIT

101. **ADVANCED INVERTEBRATE ZOOLOGY.**—A survey of the invertebrate animals, from evolutionary and phylogenetic aspects. Morphology, modes of nutrition and reproduction, interrelationships with other animals, and distribution in time and space, are considered, as well as classification. Marine, fresh-water and land faunas representative of each major group are studied. Reference is made to various monographs and scientific classics dealing with certain groups of invertebrates, as well as to historically important phylogenetic theories and interpretations. Credit, 3.

One class hour; two 2-hour laboratory periods. Assistant Professor TRAVER.
Prerequisite, Zoology 25 or its equivalent.

102. **PROBLEMS IN INVERTEBRATE ZOOLOGY.**—Invertebrate fauna of local ponds, streams and bogs. Morphology, habits, life cycles and classification of fresh-water protozoans, sponges, flatworms, bryozoans and crustaceans, with a survey of the important literature on each group. Several field trips. Discussion period and two laboratory periods per week. Credit, 3.

Prerequisite, Zoology 25, or 70, or equivalent. Assistant Professor TRAVER.

103. **ANIMAL PARASITOLOGY.**—Important protozoan and helminthic parasites of man and domestic animals. Emphasis is placed upon morphology, physiological activities, classification and phylogeny of the parasites life cycles, vectors, and modes of transmission; host-parasite relationships, and other fundamental principles of parasitism as a way of life. Credit, 3.

One class hour; two 2-hour laboratory periods. Assistant Professor TRAVER.

104. **PROBLEMS IN PARASITISM.**—External and internal parasites, of representative animals; preparation of parasites and parasitized organs for study;

classification, structure and life cycles of parasites and effect upon their hosts. Seminar reports on recent important phases of parasitology. Discussion period and two laboratory periods per week. Credit, 3.

Prerequisite, Zoology 69 or its equivalent.

Assistant Professor TRAVER.

105. THE PHYLOGENY AND MORPHOLOGY OF ARTHROPODS OTHER THAN INSECTS.—Especial attention is given to the grouping of Arthropods on the basis of morphological characters that are of taxonomic importance. This work is supplemented by assigned reading in literature dealing with the subject. Credit, 3. One class hour; two 2-hour laboratory periods. Assistant Professor HANSON.

107. FISHERY BIOLOGY.—Theory in the practice of regulating fresh-water fisheries; the physical and biological conditions of the environment and their influence on fish populations. Credit, 3.

Prerequisite, Zoology 82 and permission of the instructor.

MR. ANDREWS.

114. ADVANCED ANIMAL ECOLOGY.—An advanced course dealing with the fundamentals of environments. Detailed field studies of the biotic and physical conditions of various environments are given. Ordinarily offered in Fall Semester only. Credit, 3.

Prerequisite, Entomology 79 or its equivalent.

Professor SWEETMAN.

120. EXPERIMENTAL EMBRYOLOGY.—Lectures, seminar reports and laboratory work dealing with the chief factors in the mechanics and physiology of development: the germ cells; fertilization, establishment of the primary axis; embryonic induction, and differentiation. Credit, 3.

Prerequisites, Zoology 75 and 76 or equivalent.

Professor WOODSIDE.

125. GENERAL CYTOLOGY.—A consideration of the morphological features of cells in relation to their function. Lectures, seminar reports and laboratory work will deal with cytoplasmic structure and inclusions and nuclear phenomena. First Semester 1949-50. Credit, 3.

Prerequisite, Zoology 51.

Assistant Professor ROLLASON.

126. SPECIAL CYTOLOGY.—A consideration of special problems in cytology such as growth, differentiation, ageing, cytogenetics, and the application of physical and chemical methods to the study of cytophysiology. Lectures, seminar reports and laboratory. First Semester 1950-51. Credit, 3.

Prerequisite, Zoology 125.

Assistant Professor ROLLASON.

141. COMPARATIVE PHYSIOLOGY.—A course designed to familiarize students with the physiological principles and adaptations to the environment of animals throughout the invertebrate and vertebrate phyla. In the laboratory the experimental method will be developed involving general procedures and individual problems. First Semester 1949-50. Credit, 4.

Two class hours; two 3-hour laboratory periods.

Professor BISHOP.

Prerequisites, Zoology 1, 35.

142. GENERAL CELLULAR PHYSIOLOGY.—Lectures and laboratory covering properties and processes common to all organisms, including protoplasmic organization, permeability, metabolism, movement, bioelectricity, and reproduction. Credit, 4.

Two class hours; two 3-hour laboratory periods.

Professor BISHOP.

Prerequisites, One year biology; organic chemistry.

143. ENDOCRINOLOGY.—Emphasis will be directed toward the importance of the endocrines in their control over normal functions (growth, metabolism, repro-

duction, etc.) in a variety of animals. Laboratory work will consist of demonstrations and individual problems.

First semester 1949-50.

Credit, 1

Two class hours; one 3-hour laboratory period. Assistant Professor SNEDECOR

145. ADVANCED VERTEBRATE PHYSIOLOGY.—An opportunity for the student to gain experience in small animal surgery and in making standard experimental preparations. Suitable techniques for recording results will be employed, and the proper interpretation of the acquired data will be stressed. First semester 1950-51.

Credit, 1

One class hour; one 4-hour laboratory period. Assistant Professor SNEDECOR

Prerequisites, Zoology 35, 65, 66.

150. SPECIAL PROBLEMS.

Credit Variable

THE DEPARTMENT

155. DEPARTMENTAL SEMINAR.

Credit, 1

THE DEPARTMENT

160. PHYSIOLOGY SEMINAR.—Organization and Structure of Protoplasm. Review of the literature and discussions of principles and current experimental procedures involved. Presented jointly with staff members of zoology, chemistry, botany, and bacteriology departments.

Credit, 1

Professor BISHOP

200. THESIS.

Credit, 10

THE DEPARTMENT

COURSES FOR MINOR CREDIT ONLY

50. HISTOLOGY OF VERTEBRATES.

Credit, 1

51. MICROTECHNIQUE.

Credit, 1

65, 66. COMPARATIVE VERTEBRATE ANATOMY.

Credit, 1

75, 76. VERTEBRATE EMBRYOLOGY.

Credit, 1

80. ORNITHOLOGY.

Credit, 1

82. VERTEBRATE ZOOLOGY.

Credit, 1

85. CLASSES OF ARTHROPODS OTHER THAN INSECTS.

Credit, 1

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Bulletin

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

**TWELVE-WEEK
SUMMER SESSION
1949**



The University of Massachusetts announces another twelve-week Summer Session beginning June 13 and ending September 3, 1949. The purpose is to afford an opportunity for qualified students to continue their education through intensive study in various fields of Science and the Liberal Arts.

All courses offered are of college grade and taught by members of the University faculty.

Officers of Administration

Ralph A. Van Meter M.A., Ph.D.....	President
William L. Machmer, M.A. D.Ed., D.H.L.....	Dean of The University and Director of Summer Session
Fred J. Sievers, M.S.....	Director of the Graduate School
Marshall O. Lanphear, M.S.....	Registrar
Donald W. Cadigan, M.S.....	Assistant Registrar
Robert S. Hopkins, Jr., B.A., M.Ed.....	Dean of Men
Helen Curtis, A.B., A.M.....	Dean of Women
James W. Burke, B.A.	Secretary
Basil B. Wood, A.B.....	Librarian
Robert J. Morrissey, M.S.....	Assistant Placement Officer and Veterans' Coordinator

Faculty of the Summer Session, 1949

Doric Alviani, Assistant Professor of Music
Earl J. Anderson, Assistant Professor of Civil Engineering
Oscar G. Anderson, Assistant Professor of Pomology
Harold D. Boutelle, Assistant Professor of Mathematics
Lawrence E. Briggs, Assistant Professor of Physical Education
Robert S. Burpo, Assistant Professor of Physics
Theodore C. Caldwell, Head, Department of History
George W. Cannon, Assistant Professor of Chemistry
Harold W. Cary, Professor of History
Katherine A. Clarke, Assistant Professor of French
Alton B. Cole, Instructor in Forestry
Richard M. Colwell, Assistant Professor of Business Administration
Benjamin C. Crooker, Instructor in Physics
Alexander M. Cruickshank, Instructor in Chemistry
John H. Dittfach, Assistant Professor of Mechanical Engineering
Fred C. Ellert, Associate Professor of German
Robert S. Feldman, Assistant Professor of Psychology
Carl R. Fellers, Head, Department of Food Technology
Vernon L. Ferwerda, Assistant Professor of Government
Philip L. Gamble, Acting Dean, School of Business Administration
Harry N. Glick, Professor of Philosophy
Maxwell H. Goldberg, Professor of English
Albert E. Goss, Instructor in Psychology
Paul G. Graham, Professor of Language & Literature, Smith College
Harold E. Hardy, Professor of Business Administration
Karl N. Hendrickson, Associate Professor of Civil Engineering
J. Henry Korson, Professor of Sociology
Joseph W. Langford, Associate Professor of Electrical Engineering
Arthur S. Levine, Assistant Professor of Food Technology
Helen S. Mitchell, Dean, School of Home Economics.
Bruce Morris, Associate Professor of Economics
D. Horace Nelson, Assistant Professor of Dairying
Arthur E. Niedeck, Assistant Professor of Speech
William G. O'Donnell, Assistant Professor of English
Charles F. Oliver, Assistant Professor of Education
Elmer C. Osgood, Assistant Professor of Civil Engineering

Sara C. Piatt, Assistant Professor of Home Economics
 Albert W. Purvis, Head, Department of Education
 John A. Redmond, Principal of West Springfield High School
 Victor A. Rice, Dean, School of Agriculture
 Walter S. Ritchie, Head, Department of Chemistry
 John E. Roberts, Assistant Professor of Chemistry
 Israel H. Rose, Assistant Professor of Mathematics
 Sargent Russell, Instructor in Agricultural Economics
 Ezra Schabas, Instructor in Music
 Norman J. Schoonmaker, Assistant Professor of Mathematics
 Harold W. Smart, Assistant Professor of Economics
 J. Harold Smith, Professor of Chemistry
 Theodore R. Vallance, Assistant Professor of Psychology
 H. Leland Varley, Assistant Professor of English
 Leonard R. Wilson, Chairman, Dept. of Geology and Mineralogy

CALENDAR

First Term - June 13 to July 23

June 13 - 9:00 a.m. - 12:00 M. Registration, Drill Hall
 1:00 p.m. - 3:00 p.m. Registration, Drill Hall
 June 14 - 8:00 a.m. Classes begin
 July 4 - Holiday. Classes normally scheduled for this day
 will be held Saturday, July 9.
 July 22, 23 - Final exams for First Six-Week Session
 July 23 - 12:00 M. End of First Six-Week Session

Second Term - July 25 to September 3

July 25 - 8:00 a.m. Classes begin. (Students registering
 for the second term who did not register for the
 first term, are urged to register in advance, on
 Friday, July 22.)
 Sept. 2, 3 - Final Exams for Second Six-Week Session
 Sept. 3 - 12:00 M. End of Summer Session.

GENERAL INFORMATION

Admission: Enrolment is open to students who have completed the
 equivalent of one year of resident collegiate work in an ac-
 credited institution.

Expenses:

- Tuition for Residents of Massachusetts

(a) 12-week program	\$40.00
(b) 12 weeks, one course only	25.00
(c) 6-week program	25.00
(d) 6 weeks, one course only	15.00
- Tuition for Non-Residents and Veterans under Public Laws
 16 and 346 (Undergraduates only).

(a) 12-week program.....	\$160.00
(b) 12 weeks, one course only	100.00
(c) 6-week program	100.00
(d) 6 weeks, one course only	60.00
- Students Activities Fee, All Students 4.00

4. Board for 12 weeks at \$11.25 per week.....\$135.00
Board for 6 weeks at \$11.25 per week \$67.50
(Board rates subject to change.)
5. Room rent for 12 weeks at \$3.50 per week \$42.00
Room rent for 6 weeks at \$3.50 21.00
6. Payment of summer session fees is due June 6 and must be paid at or before registration. No student will be eligible to attend classes until fees are paid.

Rooms and Board: Students, not commuting from home, are required to live in University Dormitories and board at the Dining Halls.

Board tickets are sold at the rate of \$9.50 for five days, Monday through Friday. Saturday and Sunday board at University Dining Halls is optional.

Course Offerings: The University reserves the right to withdraw any course in which less than eight students are enrolled.

All courses carry regular University Credit. A complete description of course content may be found in the regular University catalogue for 1948-1949.

Students must have the permission of the Dean to take more than two courses during any one session.

Advance Enrolment; Veterans and Civilians: In order to facilitate arrangements, students contemplating attendance should notify the Dean at once, using the application form on page 8.

Veterans who plan to enrol under the G.I. Bill must present at the time of registration evidence of eligibility. (V.A. certificate or, if previously enrolled, a clearance through the University Coordinator).

New students who are not under G.I. Bills must file certificate of residence with the Treasurer's Office.

LIST OF COURSES

The following courses will be offered in accordance with the schedule indicated. In general, courses numbered 50 or above are acceptable for graduate credit.

FIRST SESSION-JUNE 13-JULY 23, 1949

Course	Cr.	Schedule
Chemistry 29, Qualitative Analysis (Prerequisite, General Chemistry)	4	1-4:50 MTWTF Goessmann 26 & 7
Chemistry 51, Organic Chemistry (Prerequisite, Qualitative Analysis)	4	10-11:50 MTWTF 1-4:50 TT Goessmann 26 & 112
Chemistry 65, Physical Chemistry (Prerequisite, Quantitative Analysis, Integral Calculus, a basic Course in Physics)	4	8-9:50 MTWTF; 1-4:50 MW Goessmann 26 & 128
Dairy 78, Ice Cream Making	4	8-11:50 MWF; Flint Lab.
Accounting 25, Principles of Bus. Acctg.	3	1-3:50 MTWTF North College 407
Economics 25, Elements of Economics	3	10-11:50 MTWTF Stockbridge 102

Economics 51, Econ. of Bus. & Industry	3	10- 11:50 MTWTF Lib. Arts Annex 1
Economics 53, Money, Banking & Credit	3	10-11:50 MTWTF Stockbridge 113
Economics 57, Corporation Finance	3	8-9:50 MTWTF Lib. Arts Annex 1
Economics 78, Public Finance	3	1-2:50 MTWTF Lib. Arts Annex 1
Government 25, American Government	3	8-9:50 MTWTF Goessmann 28
Government 66, American Political Thought	3	10-11:50 MTWTF Goessmann 28
C. E. 28, Property & Topographic Surveying	3	(3 44-hour weeks)
C. E. 30, Route Surveying Practice	3	(3 44-hour weeks)
E. E. 75, Applied Electronics (Prerequisite, Electronics)	3	10-10:50 MTWTF; 1-4:50 TT Engin. Annex 4
E. E. 77, Electrical Transmission (Prerequisite, Alternating-current Circuits)	3	11-12:20 MTWTF Engin. Annex 4
M. E. 64, Engineering Thermodynamics II (Prerequisite, Engineering Thermodynamics I)	4	8-9:50 MTWTF Engin. Annex 4
M. E. 79 Mechanical Engineering Lab. (Prerequisite, Thermodynamics or Heat Engin.)	2	1-2:50 MTWTF Engin. Shop
English 25, Survey of English Literature	2	8-8:50 MTWTF Old Chapel B
English 29 & 30, Public Speaking	2	9-9:50 MTWTF Old Chapel Aud.
English 54, Milton	3	10-11:50 MTWTF Old Chapel B
Speech 92, Extempore Speech	3	10-11:50 MTWTF Old Chapel Aud.
Education 51, Principles & Methods	3	8-9:50 MTWTF Lib. Arts Annex 32
Education 53, Educ. Tests & Measurements	3	10-11:50 MTWTF Lib. Arts Annex 32
Education 72, Voc. Education in Agri.	3	10-11:50 MTWTF Lib. Arts Annex 30
Education 75, Technique of Teaching Voc. Agriculture	3	8-9:50 MTWTF Lib. Arts Annex 30
Food Tech. 51, Introductory Course	3	1-4:50 MWF Food Tech. Bldg.
Food Tech. 61, Industrial Technology (Prerequisite, Introductory Food Tech. & Introductory Bacteriology)	3	1-4:50 MWF Food Tech. Bldg.
Forestry 52, Forest Photogrammetry	3	1-3:50 MTWTF French Hall 106
Forestry 55, Elements of Forest Mensuration	3	8-10:50 MTWTF French Hall 106
French 1, Elementary French	3	10-11:50 MTWTF Lib. Arts Annex 11
French 3, Intermediate French	3	10-11:50 MTWTF Lib. Arts Annex 8

French 79, Introduction to France (Prerequisite, Intermediate French)	3	8-9:50 MTWTF Lib. Arts Annex 3
Geology 27, Physical Geology	3	9-9:50 MTWTF; 1-3:50 TT Fernald Hall K & B
German 1, Elementary German	3	10-11:50 MTWTF Lib. Arts Annex 3
German 25, Intermediate German	3	8-9:50 MTWTF Lib. Arts Annex 3
History 6, Modern European Civ.	3	8-9:50 MTWTF Old Chapel C
History 59, History of the U.S.	3	10-11:50 MTWTF Old Chapel C
Mathematics 29, Differential Calculus (Prerequisite, Analytic Geometry)	3	8-9:50 MTWTF Math. Bldg. B
Mathematics 55, Mathematics of Finance (Prerequisite, Algebra & Trigonometry)	3	10-11:50 MTWTF Math. Bldg. B
Mathematics 91, Calculus & Differential Equations (Prerequisite, Differential Calculus)	3	10-11:50 MTWTF Math. Bldg. G
Music 51, Discovering Music	3	1-2:50 MTWTF Memorial Bldg.
Philosophy 62, History of Philosophy	3	8-9:50 MTWTF Stockbridge 114
Philosophy 64, Ethics	3	10-11:50 MTWTF Stockbridge 114
Phys. Ed. 42, Aquatics & Problems	3	By arrangement Phys. Ed. Bldg.
Physics 25, Mechanics, Sound & Heat	4	10-11:50 MTWTF 1-2:50 TT Physics Lab.
Psychology 86, Industrial Psychology (Prerequisite, General Psychology)	3	10-11:50 MTWTF Lib. Arts Annex 27
Psychology 84, Abnormal Psychology (Prerequisite, General Psychology)	3	8-9:50 MTWTF Lib. Arts Annex 27
Sociology 28, Introduction to Sociology	3	10-11:50 MTWTF Old Chapel D
Sociology 54, Race Relations (Prerequisite, Introductory Sociology)	3	8-9:50 MTWTF Old Chapel D
Pomology 53, General (June 27 - July 16)	3	French Hall 210
Home Economics 101, Workshop in Nutrition Education (July 5 - July 23)	3	Skinner Hall

SECOND SESSION-JULY 25-SEPTEMBER 3, 1949

Agri. Econ. 79, Elementary Statistics	3	1-3:50 MWF; 1-2:50 TT Stockbridge 220
Animal Hus. 91, Genetics & Eugenics	3	10-11:50 MTWTF Stockbridge 102
Chemistry 30, Quantitative Analysis (Prerequisite, Qualitative Analysis)	4	1-4:50 MTWTF Goessmann 26 & 7
Chemistry 52, Organic Chemistry (Continuation of First 6 weeks)	4	10-11:50 MTWTF 1-4:50 TT Goessmann 26 & 112

Chemistry 66, Physical Chemistry (Continuation of First 6 weeks)	4	8-9:50 MTWTF; 1-4:40 MW
Accounting 26, Principles of Bus, Acctg.	3	Goessmann 26 & 128 1-3:50 MTWTF North College 407
Business Law 70	3	10-11:50 MTWTF Lib. Arts Annex 1
Economics 26, Elements of Distribution (Prerequisite, Elements of Economics)	3	8-9:50 MTWTF Stockbridge 218
Economics 73, Modern Economic Theory	3	8-9:50 MTWTF Lib Arts Annex 1
Marketing 54, Salesmanship and Sales Marketing	3	8-9:50 MTWTF Goessmann 28
Marketing 73, Advertising	3	10-11:50 MTWTF Goessmann 28
C. E. 52, Applied Mechanics (Kinetics) (Prerequisite, Statics)	3	8-9:50 MTWTF Stockbridge 110
C. E. 76, Fluid Mechanics (Prerequisite, Kinetics; a basic course in Physics)	4	10-11:50 MTWTF; 1-4:50 TT Engin. Annex 4
Education 83, Princ. of Secondary Education	3	8-9:50 MTWTF Lib. Arts. Annex 32
Education 88, The School Curriculum	3	10-11:50 MTWTF Lib. Arts Annex 32
English 26, Survey of English Literature (Continuation of First 6 wks.)	2	Sec. I 9-9:50 MTWTF Sec. II 10-10:50 MTWTF Old Chapel A
English 56, American Prose	3	10-10:50 MTWTF Old Chapel B
English 77, The Modern Novel	3	8-9:50 MTWTF Old Chapel B
Food Tech. 52, Food Products and Adjuncts (Prerequisite, Introductory Food Tech.)	3	1-4:50 MWF Food Tech. Bldg.
Food Tech. 62, Industrial Technology (Continuation of First 6 weeks)	3	1-4:50 MWF Food Tech. Bldg.
French 2, Elementary French (Continuation of First 6 weeks)	3	10-11:50 MTWTF Lib. Arts Annex 11
French 4, Intermediate French (Continuation of First 6 weeks)	3	10-11:50 MTWTF Lib. Arts Annex 8
French 53, French Lit. of the 20th Cent. (Prerequisite, Intermediate French)	3	8-9:50 MTWTF Lib. Arts Annex 8
German 2, Elementary German (Continuation of First 6 weeks)	3	10-11:50 MTWTF Lib. Arts Annex 3
German 26, Intermediate German (Continuation of First 6 weeks)	3	8-9:50 MTWTF Lib. Arts Annex 3
History 65, 19th and 20th Century England (Prerequisite, a course in English History)	3	8-9:50 MTWTF Old Chapel C
History 70, Europe Since 1918 (Prerequisite, a course in Modern European Civilization or English History)	3	10-11:50 MTWTF Old Chapel C

Mathematics 30, Integral Calculus (Prerequisite, Differential Calculus)	3	8-9:50 MTWTF Math. Bldg. B
Mathematics 72, History of Mathematics (Prerequisite, Integral Calculus)	3	10-11:50 MTWTF Math. Bldg. B
Mathematics 92, Calculus & Differential Equations (Continuation of First 6 wks)	3	10-11:50 MTWTF Math. Bldg. G.
Music 52, Great Periods of Music	3	1-2:50 MTWTF Memorial Bldg.
Phys. Ed. 42, Aquatics & Problems	3	By arrangement Phys. Ed. Bldg.
Physics 26, Light & Electricity (Prerequisite, Physics 25 - Mechanics, Sound, Heat)	4	10-11:50 MTWTF 1-2:50 TT Physics Lab.
Psychology 26, General Psychology	3	10-11:50 MTWTF Lib. Arts Annex 27
Psychology 91, Child & Adolescent Psychology (Prerequisite, General Psychology)	3	8-9:50 MTWTF Lib. Arts Annex 27
Sociology 75, Social Problems (Prerequisite, Introductory Sociology)	3	8-9:50 MTWTF Old Chapel Aud.
Sociology 57, The Family (Prerequisite, Introductory Sociology)	3	10-11:50 MTWTF Old Chapel Aud.
Home Econ. 181, Workshop in Teaching Home Ec. (July 25 - August 13)	3	Skinner Hall

APPLICATION FOR ADMISSION

Prospective students may use the form below in applying for admission to the 1949 Summer Session. This should be sent to The Dean, University of Massachusetts, Amherst, Mass.

UNIVERSITY OF MASSACHUSETTS 1949 Summer Session

Name

Address

First Six Weeks:

Second Six Weeks:

I am a graduate of

and received my degree in on 19..

I am a college student at

in my year.

I will need a room in the dormitory (Please check)

I will commute (Please check)

Bulletin

UNIVERSITY OF
MASSACHUSETTS

STOCKBRIDGE SCHOOL
OF AGRICULTURE
1949-1950



"No other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought, as agriculture. I know nothing so pleasant to the mind as the discovery of anything that is at once new and valuable—nothing that so lightens and sweetens toil as the hopeful pursuit of such discovery. And how vast and how varied a field is agriculture for such discovery. The mind, already trained to thought in the country school or higher school, cannot fail to find there an exhaustless source of enjoyment. Every blade of grass is a study; and to produce two where there was but one is both a profit and a pleasure. And not grass alone; but soils, seeds, and seasons; hedges, ditches and fences; draining, drouths, and irrigation; plowing, hoeing and harrowing; reaping, mowing and threshing; saving crops, pests of crops, diseases of crops, and what will prevent or cure them; implements, utensils, and machines, their relative merits, and to improve them; hogs, horses, and cattle; sheep, goats, and poultry; trees, shrubs, fruits, plants, and flowers; the thousand things of which these are specimens—each a world of study within itself."

— ABRAHAM LINCOLN —

*From address at Wisconsin State Fair,
Milwaukee, Wisconsin, September 30, 1895.*

Note: President Abraham Lincoln signed the bill known as the Morrill Act, sponsored by Senator Justin Morrill of Vermont, in 1862 in the midst of the great Civil War. This law established agricultural colleges in every state of the country under federal aid.

Massachusetts accepted the provisions of this Act in 1863, indicating that "the leading object of the College shall be to teach subjects relating to agriculture and the mechanic arts so as to promote liberal and practical education."

Thus was born our modern system of agricultural education which is contributing so greatly to the health and welfare of this nation and of the world.

Bulletin

UNIVERSITY OF MASSACHUSETTS

Stockbridge School of Agriculture
1949-1950



The University of Massachusetts is both a State University and a Land Grant College and as such has been established by Acts of Congress and of the Legislature of Massachusetts.

The two year course in practical agriculture at The University of Massachusetts is known as The Stockbridge School of Agriculture, named after an early president of the University. Included herein are descriptions of the various courses offered, information concerning expenses, enrolment, regulations, etc. In the back of catalogue will be found forms for application and certificate of citizenship.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

UNIVERSITY BULLETIN

Amherst, Massachusetts

VOLUME XLI

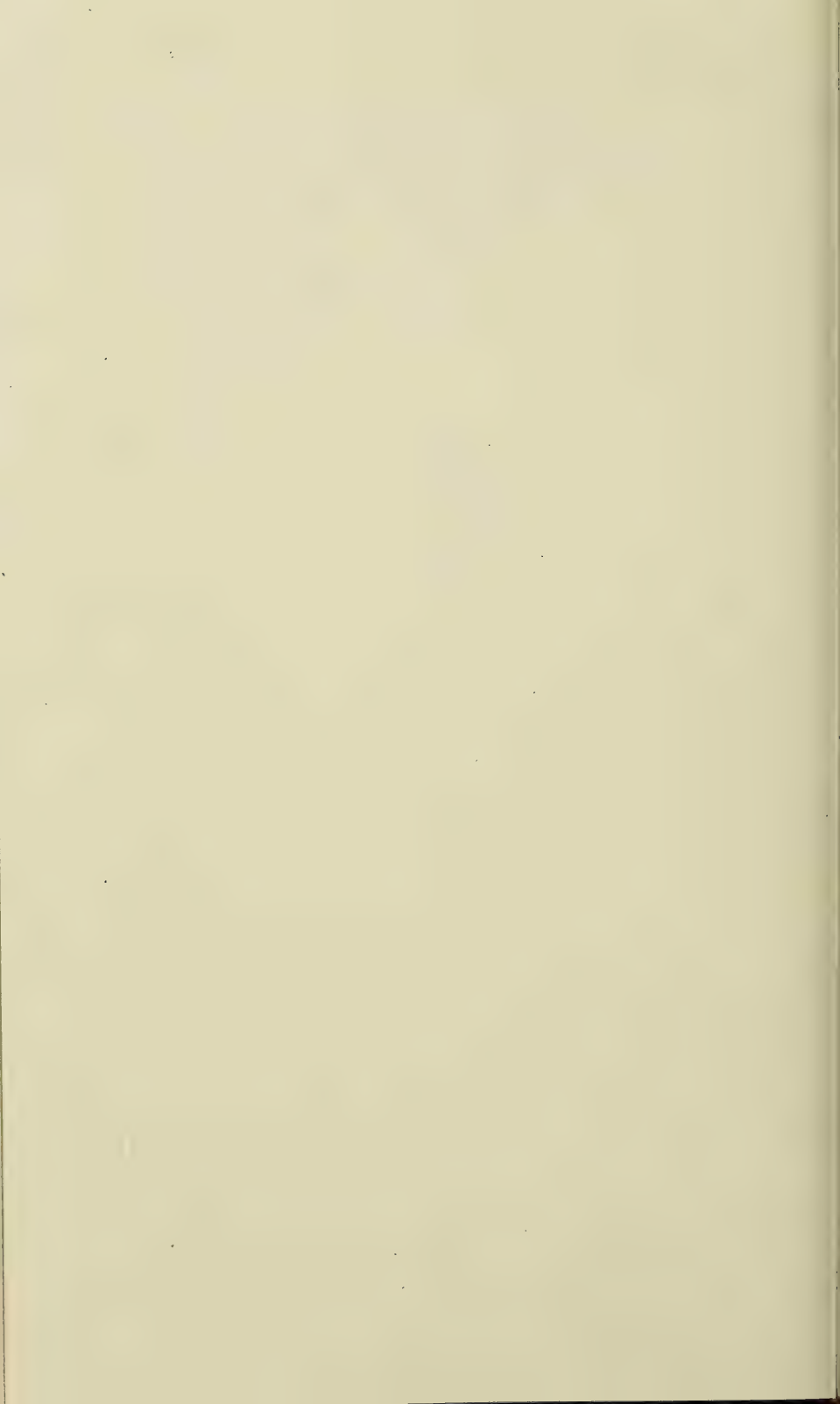
JUNE, 1949

NUMBER 45

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FOREWORD

Since 1918 the University of Massachusetts has been providing for its citizens a two-year vocational program of courses covering the principal fields of technical and applied agriculture and horticulture. This past year the total enrolment in the Stockbridge School of Agriculture was 413 including 225 veterans. The Freshman class was limited to 255 students.

The Place of Agriculture in Education.—By John Chandler, Commissioner of Agriculture for Massachusetts. Excerpts.

"I am sure you join with me in marveling at the tremendous strides which have been made in agriculture during the last twenty-five years. When I started farming, thirty-five years ago, we were farming just about the way our fathers and grandfathers had farmed for hundreds of years. We were following methods and practices handed down from father to son, ways which had proved practical by trial and error. To be sure there had been a few advances, the steel plow, the mowing machine, the binder and the ensilage cutter and crude manure spreaders had come into use. Now only a short generation later we look back on those early days and marvel at the advances which have taken place in plant and livestock breeding, in mechanization made possible by the internal combustion engine and electric power, in chemistry as expressed in new fertilizer and spray materials, in the science of bacteriology, in cultures and tillage practices, and in the physical methods of caring for soils, known as soil conservation practices.

I can remember hoisting hay by the forkful on to endless loads and mowing it away by hand in the smothering heat of dusty haylofts; doing all the milking by hand by the light of a lantern; driving the cows out to watering troughs in the yard, winter and summer; cutting ensilage corn with a corn knife and gathering it in armfuls and placing it on wagons to draw to the silo. I can remember cutting ice in the winter and bucking it into the ice house, digging it out every day all summer to float in a tank to keep the milk sweet; the endless fixing of fences; shovelling out manure in the winter on a little sled body and spreading by hand on the snow; driving every day through snow or mud over dirt roads in an express wagon three miles to a railroad station carrying eight-quart cans of milk which went to some milk dealer in a distant city, who paid me what he thought he could get away with—usually 2½ to 3 cents per quart; walking behind a plow, and then,—Oh glorious day, riding a sulky plow—bumping over the stones, and walking all day in the dust behind one kind of a harrow or another. Clearing out stone walls with horses, a drag, crowbars—a very slow and expensive undertaking.

All these things are just back around the corner. It is almost incredible how we have advanced. No longer are we farmers bowed down by never-ending drudgery, and too tired to raise our eyes to the new horizons ahead. Today the farmers of Massachusetts are using their minds and their ingenuity in growing better and larger crops, with less and less labor. I believe we are right at the start of the greatest renaissance our agriculture has ever experienced. Younger men are stepping in to operate our farms, using their brains and imaginations as well as their strong bodies. They are expanding and improving their farms as never before. They are building into their enterprises greater stability with security for themselves and their families. Of all the classifications of industries in our State today—farming is the most up-and-coming—is advancing the fastest, and offers the greatest opportunity for young men endowed with adventurous and pioneer spirit.

The land is the same good land we have always had, but we are learning to improve and expand our acres with the help of modern heavy equipment so that our little old farms, cut up into small fields surrounded by stone walls and bushes, are beginning to blossom with large fields suitable for the use of modern

equipment, so that in the next few years, I believe, our countryside, will be dotted with as efficient farms as there are anywhere in the world. Add to this the fact that we operate in the midst of a dense population, with the finest markets anywhere at our very doors. Is it any wonder that the young men are beginning to see the prospects ahead and that a pioneer spirit is abroad in our countryside? **

A hundred, or a thousand years ago for that matter, agriculture was a trade and was not considered a fitting subject for intellectual development. Almost everybody was a farmer back home anyway and was well aware of the relation between food and life. The facts of life were all about them. But since that day the industrial era has changed our civilization as we know it. Now a fortunate few raise all the food for the many. Most everybody is so far removed from the soil, particularly in industrial regions like ours, that they have lost track of one of the great fundamentals of existence. An educated man should understand the Mendelian Law, how plants grow, and what makes a good soil; he should have comprehension of the effect of soil on civilization, and of the arguments for and against the Malthusian theory.

The purpose of an academic education is not the imparting of information but rather the discipline of the mind together with an acquaintance with some of the eternal truths which are the foundation of our civilization. My contention is that the study of the fundamental axioms of agriculture is as sound a basis for mind training as any of the subjects traditionally found in a liberal arts course—and most necessary in this day and age, lest our so-called educated man lose touch altogether with an important source of our civilization. What the farmer of yesterday, today, and tomorrow needs to know are the underlying principles of agriculture and enough practical skills in the field so that he will be able to use the tools of his calling efficiently. And so I come up with the proposition that an understanding of the fundamental principles of agriculture is an essential part of a liberal education. * * * *

To sum up then—the type of farmers, together with farming, in Massachusetts is changing rapidly under the stimulus of impelling advancements in science and engineering. No longer should farming be considered a trade, in which skill is the only desirable teaching objective. What appears to be needed *today* and *tomorrow* is a trained mind and a broad understanding of the fundamentals of agriculture and enough vocational training so that the beginner will have adequate knowledge of farming procedures to make a creditable start. From then on he is on his own. And, finally, that these principles of Agriculture have a place in cultural education."

New Program for Post-War Period.—Today The Stockbridge School of Agriculture is organized and equipped to meet the needs of the discharged and disabled service man or woman, and of non-veteran citizens so far as housing and instruction facilities may permit.

Courses described in this catalog will be of particular value to veterans who have a sound reason for going into an agricultural business, and who fully realize the usual risks and difficulties that are bound to arise. To more fully acquaint them with both the opportunities and the limitations involved,—and the non-veteran needs the same information,—we are including here an excellent statement taken from the booklet "Agricultural Facts About Massachusetts" published by the Massachusetts Development and Industrial Commission. This was prepared by Louis A. Webster, a former Acting Commissioner of Agriculture of Massachusetts, 1942-44, and at present Director of Markets of the Massachusetts Department of Agriculture.

"Living on the Land and off the Land.—Farm living in Massachusetts, or elsewhere, offers an opportunity to live on the land in nature's environment and in a position to subsist to a large degree on crops of one's own production, or literally, "off the land".

Massachusetts also offers an active, though exacting, market for over a hundred million dollars worth of farm products annually. These products are now grown on 30,000 farms, covering 400,000 acres of cultivated land and a total area of 2,000,000 acres.

It should be pointed out at once that farm products, whether they are for home use or are produced by the carload, are not by any means manna from heaven. Successful production is the result of constant expenditure of physical and mental toil and the accumulation of generations of experience.

In spite of the industrialization of our State, the war years saw the greatest production of food in the whole three centuries of our experience. About 1,750,000,000 pounds of food are produced annually from the soil of Massachusetts. This fills 20% of the food needs of our people.

The soil of New England is not as easy to work on the average as in more typically agricultural sections of our country; but that very difficulty of operation has bred a determination to keep intact our heritage. We have probably lost less land by erosion and soil depletion than the nation has as a whole. For generations we have had to feed our soil, so that fertilization is a part of our farm practice and we are prepared to maintain and increase our soil fertility.

Due to our proximity to markets and to the size of our farms, it is naturally unprofitable to raise grain, beef, pork or fiber crops in large volume. It is desirable and necessary for us to specialize in the intensive production of such valuable crops as milk, eggs, fruit, vegetables and flowers. The crops we grow are the so-called "protective foods" that maintain our health and stamina in a vigorous climate and in an active and aggressive social order.

Massachusetts has some of the best purebred dairy herds in the world. We have some of the heaviest producing poultry flocks in existence; and our production of eggs has increased from 20,000,000 dozen in 1930 to 62,000,000 dozen in 1943. The Massachusetts apple crop totals about 3,500,000 bushels which is just enough for our own use. 500,000 barrels of cranberries a year are grown in the Bay State, accounting for 60% of the nation's total. Massachusetts vegetable growers, large and small, produce 17,000,000 bushels of vegetables yearly. Opportunities for expansion will increase when thousands of local growers produce crops for immediate freezing in hundreds of thousands of private freezers.

Thousands of acres of Massachusetts land in the Connecticut Valley, on Cape Cod and in scores of other localities have only been scratched in their possibilities for food production. Massachusetts soil is ready to add stability to the economy of thousands of part-time farmers, and to produce thousands of tons more food for our four and a third million people.

Agricultural effort has been well repaid in Massachusetts, but wealth from the soil is not released without great skill and effort. The soil is a faithful silent partner but demands aggressive and constant cooperation."

— AGRICULTURE IS BIG BUSINESS —

Few farm people and comparatively few other citizens realize the importance of agriculture in this commonwealth of ours according to Willard A. Munson, director of the University of Massachusetts Extension Service.

Massachusetts is an urban, industrial state; 90 per cent of its people live in urban centers. However, 95 per cent of the land area is rural countryside. Here 10 per cent of the population lives, but only about one-third of these are actually engaged in agriculture. In spite of this small number agriculture is a big business. It is the third largest industry in the state, outranked only by leather and textiles. The farm industry in Massachusetts represents an investment of over \$330,000,000 and in 1946 produced a gross income of approximately \$175,000,000.

In addition to the 3 per cent engaged directly in agricultural production 3 to 4 per cent are in allied industries. In other words these people are serving farmers by obtaining farm supplies and services, and by providing marketing facilities. This means approximately 100,000 jobs with 3,000 to 5,000 replacements each year in order to maintain the industry.

CALENDAR

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

1949

October 3, Monday	Freshman Registration
October 4, Tuesday	Senior Registration
October 5, Wednesday, 8:00 A.M.	First Semester begins for Freshmen and Seniors
October 5, Wednesday, 11:00 A.M.	Opening Convocation
October 12, Wednesday	Holiday, Columbus Day
November 11, Friday	Holiday, Armistice Day
November 23-28, Wednesday, 12:00 M. to Monday, 8:00 A.M.	Thanksgiving Recess
December 17-January 3, 1950, Saturday, 12:00 M. to Tuesday, 8:00 A.M.	Christmas Recess

1950

January 3, Tuesday, 8:00 A.M.	Classes Resume
January 30-February 1, Monday to Wednesday	Final Examinations
February 1, Wednesday	First Semester ends
February 6, Monday, 8:00 A.M.	Second Semester begins
February 22, Wednesday	Holiday, Washington's Birthday
March 4, Saturday, 12:00 M.	Second Semester ends for Poultry Majors
March 6, Monday	Placement begins for Poultry Students
April 1, Saturday, 12:00 M.	Second Semester ends for all courses except Food Management and Forestry
April 3, Monday	Placement begins for all majors except Food Management and Forestry
April 1-10, Saturday, 12:00 M. to Monday, 8:00 A.M.	Spring Recess
April 10, Monday, 8:00 A.M.	Classes resume
May 22-25, Monday to Thursday	Final Examinations
May 26-28, Friday to Sunday	Commencement

THE TRUSTEES

Organization of 1949

MEMBERS OF THE BOARD

	TERM EXPIRES
ERNEST HOFTYZER of Wellesley	1950
ALDEN CHASE BRETT of Belmont	1950
MRS. ELIZABETH LAURA McNAMARA of Cambridge	1951
LEONARD CARMICHAEL of Medford	1951
MRS. JOSEPH SWAN LEACH of Walpole	1952
RALPH FRED TABER of West Newton	1952
JOHN M. DEELY of Lee	1953
CLIFFORD CHESLEY HUBBARD of Mansfield	1953
HARRY DUNLAP BROWN of Billerica	1954
JOHN WILLIAM HAIGIS of Greenfield	1954
JOSEPH WARREN BARTLETT of Boston	1955
PHILIP FERRY WHITMORE of Sunderland	1955
WILLIAM MICHAEL CASHIN of Milton	1956
WILLIAM AYLOTT ORTON of Northampton	1956

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 RALPH ALBERT VAN METER, *President of the University*
 JOHN J. DESMOND, JR., *Commissioner of Education*
 JOHN CHANDLER, *Commissioner of Agriculture*

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Dean of the University

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ROBERT D. HAWLEY, M.B.A.
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Librarian of the University

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Assistant Professor OLIVER C. ROBERTS
Assistant Professor CHARLES H. THAYER

THE FACULTY OF INSTRUCTION

DORIC ALVIANI, M.Ed. <i>Assistant Professor of Music</i>	Memorial Hall
JAMES F. ANDERSON, M.S. <i>Instructor in Pomology</i>	French Hall
OSCAR G. ANDERSON, B.S. <i>Assistant Professor of Pomology</i>	French Hall
LUTHER BANTA, B.S. <i>Assistant Professor of Poultry Husbandry</i>	Stockbridge Hall
ROLLIN H. BARRETT, M.S. <i>Professor of Farm Management</i>	Stockbridge Hall
HAROLD F. BECK <i>Assistant Professor of Agricultural Engineering</i>	Stockbridge Hall
LYLE L. BLUNDELL, B.S. <i>Professor of Horticulture</i>	Wilder Hall
JAMES W. CALLAHAN, B.S. <i>Instructor in Agricultural Economics</i>	Stockbridge Hall
ALTON B. COLE, M.F. <i>Instructor in Forestry</i>	French Hall
MRS. GLADYS M. COOK, M.S. <i>Assistant Professor of Home Economics</i>	Home Economics Building
GEOFFREY S. CORNISH, B.S. <i>Instructor in Agrostology</i>	Stockbridge Hall
WILLIAM A. COWAN, B.S. <i>Assistant Professor of Animal Husbandry</i>	Stockbridge Hall
HELEN CURTIS, A.M. <i>Dean of Women</i>	South College
ELEANOR D. DAIUTE, M.D. <i>Assistant Professor of Hygiene</i>	Infirmary
DOROTHY DAVIS, M.A. <i>Instructor in Home Economics</i>	Home Economics Building
LEWELLYN L. DERBY, B.S. <i>Assistant Professor of Physical Education</i>	Physical Education Building
LAWRENCE S. DICKINSON, M.S. <i>Associate Professor of Agrostology</i>	Stockbridge Hall
CHARLES N. DUBOIS, M.A. <i>Assistant Professor of English</i>	Chapel
CHARLES W. DUNHAM, B.S. <i>Instructor in Floriculture</i>	French Hall
ROBERT D. DUNTON, B.S. <i>Instructor in Botany</i>	Clark Hall
DONALD DURELL, M.L.A. <i>Instructor in Landscape Architecture</i>	Wilder Hall
JOHN N. EVERSON, M.S. <i>Assistant Professor of Agronomy</i>	Stockbridge Hall
EUGENE J. FINNEGAN, B.S. <i>Instructor in Dairy Industry</i>	Flint Laboratory

RICHARD C. FOLEY, M.S.	Stockbridge Hall
<i>Associate Professor of Animal Husbandry</i>	
ARTHUR P. FRENCH, M.S.	French Hall
<i>Professor of Pomology and Plant Breeding; Head of the Department of Pomology</i>	
CAROL B. GAWTHROP, M.S.	South College
<i>Placement Officer for Women</i>	
EMORY E. GRAYSON, B.S.	South College
<i>Director of Placement Training</i>	
NATHAN S. HALE, B.S.	Stockbridge Hall
<i>Assistant Professor of Animal Husbandry</i>	
DENZEL J. HANKINSON, Ph.D.	Flint Laboratory
<i>Professor of Dairy Industry and Head of Department</i>	
JOHN F. HANSON, Ph.D.	Fernald Hall
<i>Assistant Professor of Entomology</i>	
ROBERT P. HOLDSWORTH, M.S.	French Hall
<i>Professor of Forestry and Head of Department</i>	
S. CHURCH HUBBARD	French Hall
<i>Assistant Professor of Floriculture</i>	
FRED P. JEFFREY, M.S.	Stockbridge Hall
<i>Professor of Poultry Husbandry and Head of Department</i>	
WALTER O. JOHNSON, B.S.	Draper Hall
<i>Manager of Dining Hall</i>	
WILLIAM B. JOHNSON, B.S.	French Hall
<i>Instructor in Olericulture</i>	
STEPHEN R. KOSAKOWSKI	Physical Education Building
<i>Instructor in Physical Education</i>	
THEODORE T. KOZLOWSKI, Ph.D.	Clark Hall
<i>Assistant Professor of Botany</i>	
OTTO G. KRANZ, B.S.	Food Technology Laboratory
<i>Assistant Professor of Food Technology</i>	
WALTER S. LAKE, B.S.	Stockbridge Hall
<i>Assistant Professor of Engineering</i>	
ROBERT P. LANE, M.A.	Chapel
<i>Instructor in English</i>	
EDWARD P. LARKIN, B.S.	Marshall Hall
<i>Instructor in Bacteriology</i>	
JOHN B. LENTZ, A.B., V.M.D.	Paige Laboratory
<i>Professor of Veterinary Science and Head of Department</i>	
ARTHUR S. LEVINE, Ph.D.	Food Technology Laboratory
<i>Assistant Professor of Food Technology</i>	
HARRY G. LINDQUIST, M.S.	Flint Laboratory
<i>Assistant Professor of Dairy Industry</i>	
ADRIAN H. LINDSEY, Ph.D.	Stockbridge Hall
<i>Professor of Agricultural Economics and Head of Department of Agricultural Economics and Farm Management</i>	
WILLIAM P. MACCONNELL, M.F.	French Hall
<i>Instructor in Forestry</i>	
MINER J. MARKUSON, B.S.	Stockbridge Hall
<i>Associate Professor of Engineering</i>	
THEODORE F. MATHIEU, B.S.	Wilder Hall
<i>Assistant Professor of Arboriculture</i>	
HELEN S. MITCHELL, Ph.D.	Home Economics Building
<i>Professor of Home Economics; Dean of School of Home Economics</i>	
D. HORACE NELSON, Ph.D.	Flint Laboratory
<i>Assistant Professor of Dairy Industry</i>	
ARTHUR E. NIEDECK, M.S.	Chapel
<i>Assistant Professor of Speech</i>	
WILLIAM G. O'DONNELL, Ph.D.	Chapel
<i>Instructor in English</i>	
ROBERT C. PERRIELO, B.S.	Marshall Hall
<i>Assistant Professor of Bacteriology</i>	
PAUL N. PROCOPIO, B.S.	Wilder Hall
<i>Instructor in Horticulture</i>	
GEORGE F. PUSHEE	Stockbridge Hall
<i>Assistant Professor of Engineering</i>	
ERNEST J. RADCLIFFE, M.D.	Physical Education Building
<i>Professor of Hygiene and Head of Department of Student Health</i>	
ARNOLD D. RHODES, M.F.	French Hall
<i>Professor of Forestry</i>	
VICTOR A. RICE, M.Agr.	Stockbridge Hall
<i>Professor of Animal Husbandry; Head of Department; Dean of the University School of Agriculture</i>	
J. HARRY RICH, M.S.	French Hall
<i>Associate Professor of Forestry</i>	
BERNARD P. RINES, B.S. in Agri. Eng., B.S. in E. E.	Agricultural Engineering Annex
<i>Instructor in Agricultural Engineering</i>	

OLIVER C. ROBERTS, M.S. <i>Associate Professor of Pomology</i>	French Hall
JOSEPH R. ROGERS, JR. <i>Assistant Professor of Physical Education</i>	Physical Education Building
DONALD E. ROSS, B.S. <i>Assistant Professor of Floriculture</i>	French Hall
GLENN C. RUSSELL, B.S. <i>Instructor in Agronomy</i>	Stockbridge Hall
WILLIAM C. SANCTUARY, M.S. <i>Professor of Poultry Husbandry</i>	Stockbridge Hall
FRANK R. SHAW, Ph.D. <i>Assistant Professor of Entomology and Beekeeping</i>	Fernald Hall
RUSSELL E. SMITH, B.S., V.M.D. <i>Associate Professor of Veterinary Science</i>	Paige Laboratory
GRANT B. SNYDER, M.S. <i>Professor of Commercial Vegetable Growing and Head of Department</i>	French Hall
HERBERT N. STAPLETON, M.S. <i>Professor of Agricultural Engineering and Head of Department</i>	Stockbridge Hall
PAUL W. STICKEL, M.F. <i>Assistant Professor of Forestry</i>	French Hall
ROBERT G. SWANSON, B.S., M.S. <i>Instructor in Animal Husbandry</i>	Stockbridge Hall
HARVEY L. SWEETMAN, Ph.D. <i>Assistant Professor of Entomology</i>	Fernald Hall
WILLIAM H. TAGUE, B.S. <i>Assistant Professor of Engineering</i>	Stockbridge Hall
FLORIANA TARANTINO, A.M. <i>Instructor in English</i>	Chapel
CHARLES H. THAYER <i>Assistant Professor of Agronomy</i>	Stockbridge Hall
CLARK L. THAYER, B.S. <i>Professor of Floriculture and Head of Department; Head of the University School of Horticulture</i>	French Hall
RUTH J. TOTMAN, M.Ed. <i>Assistant Professor of Physical Education</i>	Drill Hall
REUBEN E. TRIPPENSEE, Ph.D. <i>Professor of Wildlife Management</i>	French Hall
ALDEN P. TUTTLE, M.S. <i>Assistant Professor of Commercial Vegetable Growing</i>	French Hall
H. LELAND VARLEY, M.A. <i>Instructor in English</i>	Chapel
JOHN H. VONDELL <i>Assistant Professor of Poultry Husbandry</i>	Stockbridge Hall
MARTHA R. WRIGHT, B.S. <i>Instructor in English</i>	Chapel
ANTHONY W. ZAITZ, B.S.D. <i>Instructor in English</i>	Chapel
JOHN M. ZAK, M.S. <i>Instructor in Agronomy</i>	Stockbridge Hall
RALPH C. ZALKAN, B.S. <i>Instructor in Food Technology</i>	Food Technology Building



MEMORIAL HALL

*Erected in memory of the "Loyal Sons of Old Massachusetts"
who died in World War I.*

"We Will Keep Faith With You Who Lie Asleep."

(inscription on east co.)

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

The Stockbridge School of Agriculture is the vocational non-degree department of the University providing training of post high school grade in agriculture, horticulture, and related business activities. In October 1946, two-year short courses were resumed after terminating in June 1943 when war conditions forced a change to a one year emergency program for 1944 and 1945.

Courses are planned to be of maximum use for the returning service man or woman who may be eligible for rehabilitation training under Public Law 16 because of war injuries. They will also be useful to the non-disabled veteran, eligible for further schooling under the G. I. Bill. Public Law 346, and who is interested in training himself for a successful agricultural business in the shortest possible time.

Eleven programs of study are offered, one of which must be selected by each student and completed as specified for the school diploma. The present list of offerings includes:

School of Agriculture

- | | | | | | | | | |
|----|-------------------|---|---|---|---|---|---|---------------|
| 1. | Animal Husbandry | . | . | . | . | . | . | (see page 24) |
| 2. | Dairy Industry | . | . | . | . | . | . | (" " 29) |
| 3. | Poultry Husbandry | . | . | . | . | . | . | (" " 32) |

School of Horticulture

- | | | | | | | | | |
|----|------------------------------|---|---|---|---|---|---|-----------|
| 1. | Arboriculture | . | . | . | . | . | . | (" " 36) |
| 2. | Commercial Vegetable Growing | . | . | . | . | . | . | (" " 39) |
| 3. | Floriculture | . | . | . | . | . | . | (" " 42) |
| 4. | Food Management | . | . | . | . | . | . | (" " 45) |
| 5. | Forestry | . | . | . | . | . | . | (" " 52) |
| 6. | Fruit Growing | . | . | . | . | . | . | (" " 55) |
| 7. | Ornamental Horticulture | . | . | . | . | . | . | (" " 59) |
| 8. | Turf Maintenance | . | . | . | . | . | . | (" " 63) |

Since its organization in 1918 at the request of the Massachusetts Legislature the school has registered nearly 3,000 students and graduated twenty-seven classes. Graduates of the School are making important contributions to the food supply of this state, and will continue to do so in the years after the war.

The value of this kind of concentrated, technical schooling, aiming directly toward preparation for a definite field of work, is amply demonstrated by the successful careers of our graduates.

It is estimated about fifteen hundred farms change ownership each year in Massachusetts due to death, infirmity of age, disabling accident, or, in some few cases, just plain inefficient management. Farms will always need to have reliable sources of skilled workers and owner replacements, as war food shortages have so clearly proved, if New England crop production is to be successfully maintained on an adequate scale. This is both a challenge and an opportunity to young men and women.

In the armed forces of our country more than eight hundred Stockbridge men saw service, largely from the classes of 1939 to 1943.

General Information

Entrance Conditions:—The school program is open to any student who is seventeen years old or over and who has completed a secondary school course or its equivalent. There are no entrance examinations.

The Stockbridge School of Agriculture is not intended to divert students at present enrolled in high schools. Such students should complete the high school course if possible, since standard of class work required is practically equivalent to junior college grade.

A graduate of a Massachusetts county school of agriculture or of an agricultural department of a high school in this state, may complete certain major courses for a diploma in one year, if he is recommended by the director of the school or the agricultural instructor because of outstanding scholastic and experience record. Statement and record must be submitted from the school with application. This arrangement applies only to the Animal Husbandry, Poultry Husbandry, Commercial Vegetable Growing, Floriculture, and Fruit Growing courses.

How to Enrol.—**Civilians:** Fill out application blank, Form I, page 75, giving all information requested. Be sure to indicate course you wish to elect. Mail this form, with citizenship certificate, Form II, on same page, to Director of Short Courses. If application is accepted you will be notified, and certificate of citizenship will be kept on file until you register. Neither tuition nor fees are required until the week of registration.

Veterans:—Only citizens of Massachusetts are eligible under present limited enrolments due to crowded facilities in most courses. Because many class quotas are filled well in advance of registration, it is urged that veterans arrange for a personal interview at the Short Course Office before filing application for entrance. If and when accepted for entrance, veterans must be sure to comply with the following rules:

(1) Bring photostatic copy of discharge at time of registration if Army or Marine Corps personnel. If Navy, bring photostatic copy of your 553 form. If you have Certificate of Eligibility and Entitlement from the Veterans Administration, bring that. (2) If you have had previous schooling or on-the-job training under Veterans Administration (not here), a Supplemental Certificate of Eligibility and Entitlement must be secured from the Veterans Administration Office having your record after filing with them letter of acceptance from this office. (3) If married, you must present a marriage certificate from city or town clerk's office. If there are any dependents you must be sure to file Veterans Administration Form 509 at your nearest Veterans Administration contact office. (4) If a disabled veteran seeking training under Public Law 16, you must file Veterans Administration Form 1900 received at time of pension award at any Veterans Administration Office.

Registration.—Registration for freshmen will be held on Monday, October 3 and for seniors on Tuesday, October 4. All freshman students should be on campus from the day of registration until classes open on Wednesday, to meet required appointments for mental tests, physical examinations, and individual photographs for office records, and to have class schedules and individual programs explained.

Instruction.—Instruction is given by the University teaching staff through classroom teaching, laboratory exercises and practical work. The work of the classroom is supplemented by demonstration work in the barns, dairy plant, greenhouses, orchards, university gardens, engineering shops, quick freezing plant, canning plant, university forest, sawmill, and abattoir. The courses are planned to offer fundamental information, and to establish the underlying reasons as well as the special methods employed in the various operations. The combined advantages of university instruction and a university plant with all its varied resources are thus made available to young men and women training for successful business careers in agricultural vocations.

The usual University holidays are indicated on calendar, Page 6. First year Arboriculture students register two weeks prior to the starting of regular class work for preliminary training in the use of ropes and climbing. Freshman Poultry students complete only one month of the second semester because early placement is required by employers. Other freshman classes continue to April first, when most students are assigned to placement jobs, excepting Food Management and Forestry freshmen who complete two full semesters. Class work is required at the University in the months of October to March inclusive; place

ment training for practical experience on jobs away from the University, on a wage basis, is required of all first year students from April to September inclusive, with exceptions noted.

Diploma Requirements.—In order to obtain a diploma a student must complete satisfactorily the entire program of study in which he has registered. A student failing to pass the requirements of summer placement training, after a suitable job has been assigned him, is not eligible for graduation until this deficiency is made up, and may not be allowed to enrol for the second year, if the Director of Placement Service considers his record to be unsatisfactory.

Transfer Credits.—Graduation from the Stockbridge School of Agriculture does not fulfill the requirements for entrance in the University degree course, nor are credits earned during the course transferable regularly toward credit for a degree at this University.

Students who make outstanding scholastic and placement records in this two-year course, and whose high school preparation has been satisfactory, may transfer to the same major program in the University with credit allowances of one to two semesters, depending on the individual record. This arrangement is limited strictly to students who meet the stipulated requirements, and each case is considered individually by the Registrar.

Graduation Requirements.—No student will be graduated unless all bills due the University are paid on or before the Wednesday preceding graduation exercises.

Diplomas and letters of honorable dismissal will be withheld from all students who have not paid bills due the University, or legitimate bills due private individuals or business concerns.

A diploma will not be awarded to any senior, if arrears are reported by his fraternity. All bills for second semester, senior year, must be settled not later than the Wednesday before graduation.

Attendance at graduation exercises is required of all seniors before diploma will be awarded.

Seniors who have borrowed from the Goldthwait Loan Fund will have diplomas held as collateral by the University until they have paid up loans in full. This in no way interferes with the privileges of graduation.

Scholarship Regulations.—At the close of each semester students receive a formal report showing the standings given in the subjects pursued by them.

If a student's class average in any subject is below 50, he is failed (F) in the course without final examination privilege and must repeat course with the following class.

If the average of the class grade and the final examination is between 50 and 60, the student is thereby conditioned (#) and must repeat examination only for a pass grade.

Students will be graded by instructors at mid-semester to show general standing and at the end of semester for permanent record. The Faculty Committee* will consider all questionable grades after each marking period, and instructors will note on grade reports the names of all students whose work is seriously deficient.

When a student's record indicates failures or uniformly poor work, the Faculty Committee may recommend a close supervision of his work by the faculty adviser in his major course, or, if his scholastic grades disqualify him from further work in the school, he may be asked to withdraw at any time.

A first year student who has deficient scholastic work at the end of the first semester in February in his major courses will not be eligible for placement training until his work meets the required standard.

At the end of any semester a student who is failed or conditioned in more than one course or has conditions in more than two courses may be dismissed.

RULES AND REGULATIONS

Absences from Class

(1) No unexcused absences will be allowed from classes. (2) All excuses for absence shall be presented by the student in writing, and, if approved by the Director, an excuse card will be granted to be signed by the instructor. Excuse cards must be returned promptly to the office when properly signed. (3) Students presenting excuse cards covering absences are expected to make up all work missed, to the satisfaction of the instructor. (4) Instructors are directed to reduce final grades five points for each unexcused absence occurring on a student's record at the end of any semester. (5) No excuses will be accepted at the Short Course Office unless presented within two days after the student returns to classes. (6) Two tardinesses unexcused shall count as one absence. (7) Absences from classes immediately before or after a holiday are not allowed except by special permission. (8) The Short Course Office requires all students to report at once any illness to the university physician, particularly if continued absence from class is likely to result from the illness. (9) Students failing to observe these rules are placed on probation, and may be asked to withdraw from the course if further violations occur.

Absences from Examinations or Tests

Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests.

Student Expenses

Tuition.—A tuition fee of \$50 per semester is charged students, residents of Massachusetts, enrolled in the Stockbridge School of Agriculture. Students who are not residents of Massachusetts are charged a tuition fee of \$200 each semester. The tuition per semester, charged persons not citizens of the United States is \$200. **Students entering from Massachusetts, unless of voting age themselves, are required to file a statement signed by either town or city clerk, stating that the applicant's parent is a legal resident of Massachusetts.** (See Form II in back of catalog.)

Variation in Charges for Three Major Courses

Food Management Course.—Placement jobs in the Food Management Course are not available until after June 1, and students have to complete two semesters of resident study each year.

Poultry Husbandry Course.—Because of earlier placement required on poultry farms, students complete only one and one-quarter semesters of class work here the first year.

Forestry Course.—Two full semesters work the first year followed by four months placement training.

Summary of Expenses Estimated:

	FIRST YEAR		FIRST YEAR (Hotel & For- estry Majors)	SECOND YEAR	FIRST AND SECOND YEARS
	First Semester	Second Semester	Second Semester		Field Trips
Tuition (Citizens of Mass.)....	\$50.00	\$25.00	\$50.00	\$100.00	\$15.00-52.00
(Poultry Majors).....		12.50)			
Board (University Cafeteria)...	168.00	84.00	168.00	336.00	(Fees listed under Major Programs)
(Poultry Majors).....		42.00)			
Room Rent (Private Homes)....	72.00	36.00	72.00	144.00	
(Poultry Majors).....		18.00)			
*Student Fees (Itemized below)...	16.75	11.50	17.00	36.00	
Books, stationery, etc.	35.00	35.00	35.00	70.00	
	\$341.75	\$193.50	\$342.00	\$686.00	\$15.00-52.00
Poultry Majors		117.00			

These figures for board and room are estimates based on prevailing prices and are subject to change when and if conditions change.

Student Fees:

	FIRST YEAR (Hotel & Forestry Majors)					
	FIRST YEAR		SECOND YEAR		SECOND YEAR	
	First Semester	Second Semester	First Semester	Second Semester	First Semester	Second Semester
Athletics	\$10.00	\$ 5.00	\$10.00	\$10.00	\$10.00	\$10.00
Class Tax	1.00	1.00	1.00	1.00	1.00	1.00
Collegian	1.00	.50	1.00	1.00	1.00	1.00
Concert Fee	1.50	1.50	1.50	1.50	1.50	1.50
Northorn (School Yearbook)	2.00	3.00	2.00	3.00	3.00	5.00
Stockbridge School Activities	.50	.50	.50	.50	.50	.50
Student Handbook	.75	—	.75	—	—	—
	\$16.75	\$11.50	\$16.75	\$17.00	\$17.00	\$19.00

Tuition and fees of approximately \$67.00, are payable in full at the Treasurer's Office not later than one week after classes begin for the semester. According to administration ruling, students not paying semester accounts when due are suspended from classes. All checks payable to the University should be made out to Treasurer, University of Massachusetts.

A student who withdraws from the University for any reason before a semester is half completed will have refunded to him one-half the fees paid for that semester, but one who leaves after completing more than the half semester will be allowed no rebate fees.

The placement training period between the first and second year usually enables a student to earn from \$500 to \$1,000 depending upon his skill and general ability, and the type of work. This will pay a large part of the second year expenses.

Prospective students should understand that the above estimates cover expenses which may be called strictly University expenses, and that there are other financial obligations voluntarily assumed by students which they should expect to meet. Such expenses vary from \$28 to \$36 a year. Additional financial responsibility is also assumed by students joining fraternities or entering into other social activities of the University. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$500 to \$550 for the first year of one and one-half semesters in residence, and \$650 to \$700 for the second year of two semesters.

Rooms

Dormitory rooms are available only to students of the four year course. Private homes in the town furnish the chief source of rooms for Stockbridge students under assignment by the University Housing Office. Students are notified prior to registration of their location and should not make earlier inquiry.

Board

Stockbridge freshmen are not required to secure meals in the University cafeteria, but can do so if it is more convenient.

A number of public restaurants or dining rooms are located close to the University where most students arrange for meal service, usually approximating \$2.00 a day, with allowances made if student goes home on week-ends, class schedule permitting.

A new student should sample the various places to find one suited to his needs, where he can meet with congenial members of his class group.

Books and Supplies

For the convenience of students the University maintains a store service in North College. Here all textbooks may be purchased at cost plus transportation charges. Students are informed at the first class session in each course what books are required and must secure individual copies according to order list sent in by instructor.

There is little opportunity to secure secondhand books because most students find the texts assigned of value to retain as reference sources after completing a course.

Student Aid

Students desiring any form of financial aid from the university including scholarship, employment, or loan, are required to file applications with the Student Aid Committee not later than June 10 of each year. Incoming freshmen are allowed an extension of time.

These application forms are used to determine the comparative need of the applicants and are passed on by the Student Aid Committee. No student is eligible for any kind of financial assistance from the University unless he or she has filed the required form and has been certified as deserving by the Student Aid Committee. Application forms may be secured at the Placement Service Office, South College.

Self Help.—The University does not encourage students to enter without money in the expectation of earning their way entirely. The student will find it better to work and accumulate sufficient funds before coming to the University or else to take more than two years in completing his course.

No student should undertake work that interferes with his studies, and students should understand that no one may receive a large amount of work at the University.

First year students particularly should not risk failure in their beginning studies by taking on such extra work until they have, at least, tested themselves in the study program of the first semester. Certainly, it is advised to proceed cautiously in combining both extra work and athletics at the same time, if the student's scholastic record is at all questionable.

The Vincent Goldthwait Loan Fund.—This fund was established by Dr. Joel E. Goldthwait, U. of M. 1885, of Boston, as a memorial to his son who died in 1922 during his junior year at Harvard. Its purpose is to aid worthy senior students who find it difficult to secure adequate finances to complete their final year. Only seniors needing a supplement to funds already available will be considered. Amounts in excess of \$200.00 are rarely granted and most loans range from \$50 to \$150.00.

A regular promissory note must be executed, endorsed by parent or guardian and repayment may be made within any reasonable period after graduation up to one year. There is no interest charge.

Wilbur H. H. Ward Scholarships.—The Wilbur H. H. Ward Fund is administered by a Board of Trustees independent of the University. Applicants for these scholarships should write to Sumner R. Parker, who may be addressed at the University. They are available only to Hampshire County boys.

Ascension Farm School Corporation Scholarships.—This Corporation, which is no longer operating a special farm school, continues its specific service by providing "care, education and training in agriculture of boys resident in Western Massachusetts," as stated in its charter. Aid is available chiefly to residents of Berkshire County.

Application form should be secured in person from the Director of Short Courses after notice of admission to the Stockbridge School of Agriculture has been received. Scholarships are granted only after final approval by the Board of Trustees and officers of the Corporation.

Student Employment Projects

Part-time work is available for a limited number of candidates. The type of work to which students are assigned consists of the following:

Clerical and office, building and grounds maintenance, farm, greenhouse and orchard duties, helpers in livestock and cattle barns, and other miscellaneous types.

General Exercises

Assembly exercises are held weekly on Wednesdays, 11:00-12:00 M., and serve to bring together all Stockbridge students for a general program dealing with matters of interest to the University and the School. Among speakers who appear from time to time are the President of the University, members of the University Staff and others who have interesting subject matter to present. This weekly assembly also enables announcements concerning students and student affairs to be presented, and permits class presidents to make advance reservations for business meetings when necessary. **No unexcused absences from this exercise are allowed.**

Two assemblies each month are used for special song practice to train all students in both school and popular songs.

STUDENT ACTIVITIES

A large number of student organizations furnish opportunity to students for work and leadership.

Memorial Hall is the center of student activities and contains offices for the various student organizations, including the Stockbridge School Student Council. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool and ping pong tables; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in World War I.

For those students who play musical instruments there are opportunities with the University Orchestra and the University Band.

Student Council.—The Stockbridge School Council is composed of representatives of the first and second year classes. This body serves as a general committee on student government and helps to maintain the best traditions and customs of the School.

Shorthorn.—A student yearbook called "The Shorthorn" is published annually by the members of the graduating class, and is usually issued in June. All students subscribe to it.

Fraternities.—There are two Stockbridge fraternities for men in the student body, Alpha Tau Gamma and Kappa Kappa, both owning houses, serving as social and residential centers for their groups. For the small group of women students there is a Tri Sigma Club.

Scholastic Society

A Stockbridge Honorary Scholastic Society called "Stosag" was established in 1935 to encourage high scholarship. Students whose records show no grade below 70 in any subject and whose average for the first three semesters is 85 or better, are elected to membership in the society each June. Engraved certificates are awarded to members of the graduating class who have achieved this distinction.

Athletics and Physical Education.—The School has its own separate athletic program with regular schedules in football, basketball, ice hockey, cross-country and winter track. Sweaters and insignia are awarded to team members and managers in these sports. The official insignia is the letter S.

The football team plays a schedule of 6-7 games with preparatory school teams. The basketball team plays a 12 game schedule; the cross-country team usually runs 3 races, while 2 or 3 meets are scheduled for the winter track squad. Ice hockey affords 6 to 8 games depending on the weather.

Due to the fact that freshmen are on placement training during the spring term which leaves only seniors available, no regular team is maintained in baseball. Men desiring to play are organized into teams and an intramural league is arranged.

This athletic program is entirely under the supervision and direction of the Physical Education Department of the University and coaches are provided for all sports. Instructor Stephen R. Kosakowski, director of the Stockbridge physical education work, is coach of football, basketball, hockey, and has charge of the spring recreation program. Assistant Professor Llewellyn L. Derby, coach of the varsity track team, has charge of the cross-country and winter track squads.

All students are urged to participate in some sport each semester, but first year students should be sure all studies are well maintained. No squads are reduced by eliminating the inexperienced players, and everyone is given an opportunity to play in games. The football squads in the past have consisted of approximately 50 candidates. Games have been scheduled for both the second and third teams so that every man on the squad has participated in an outside scheduled game. Both the first and second teams in basketball have regularly scheduled games and an intramural league schedule is arranged for those not playing on the first squad.

Every care is exercised to guard against men overtaxing their strength in a sport or game to the detriment of their health. No man whose physical condition is at all questionable is allowed to play on the teams. A careful check is maintained by required physical examinations for all students given by the University physician at the opening of the school year. A second examination is made of each man before permission is granted to participate in any sport.

Students also subscribe to the university varsity games and have attendant privileges for varsity sports on the campus.

Class work in physical education for men not on athletic squads is required for both seniors and freshmen during the first semester. This consists of class periods a week. The object of this course is to give the men some knowledge of games which may be of value to them in after school days, as well as to give every man an opportunity to develop sufficient control over his body to enable him to get pleasure from physical activities and to establish correct health habits.

The freshmen receive instruction in softball, touch football, and swimming. Men may elect football or cross-country, instead of the regular class work. The seniors take up volleyball, badminton, and swimming. They may also elect football or cross-country. The classes are organized into teams which compete against each other with much rivalry. Students are expected to wear old clothes during the play period, and shower baths are required at the close of each class period.

A physical education building containing a swimming pool, a great indoor cage 150 by 180 feet for all kinds of sports and games, and complete locker room and shower bath facilities provide ample equipment to carry out this program. Individual equipment is supplied to all members of the football, hockey, basketball, cross-country, and track squads.

STUDENT RELATIONS

The customary high standard of university men in honor, manliness, self-respect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or persistent violation of rules must be reported by the instructor to the Director for discipline.

The privileges of the university may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the university, acting through its President or an administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined, but he may be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet if in the judgment of the university authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

HEALTH SERVICE

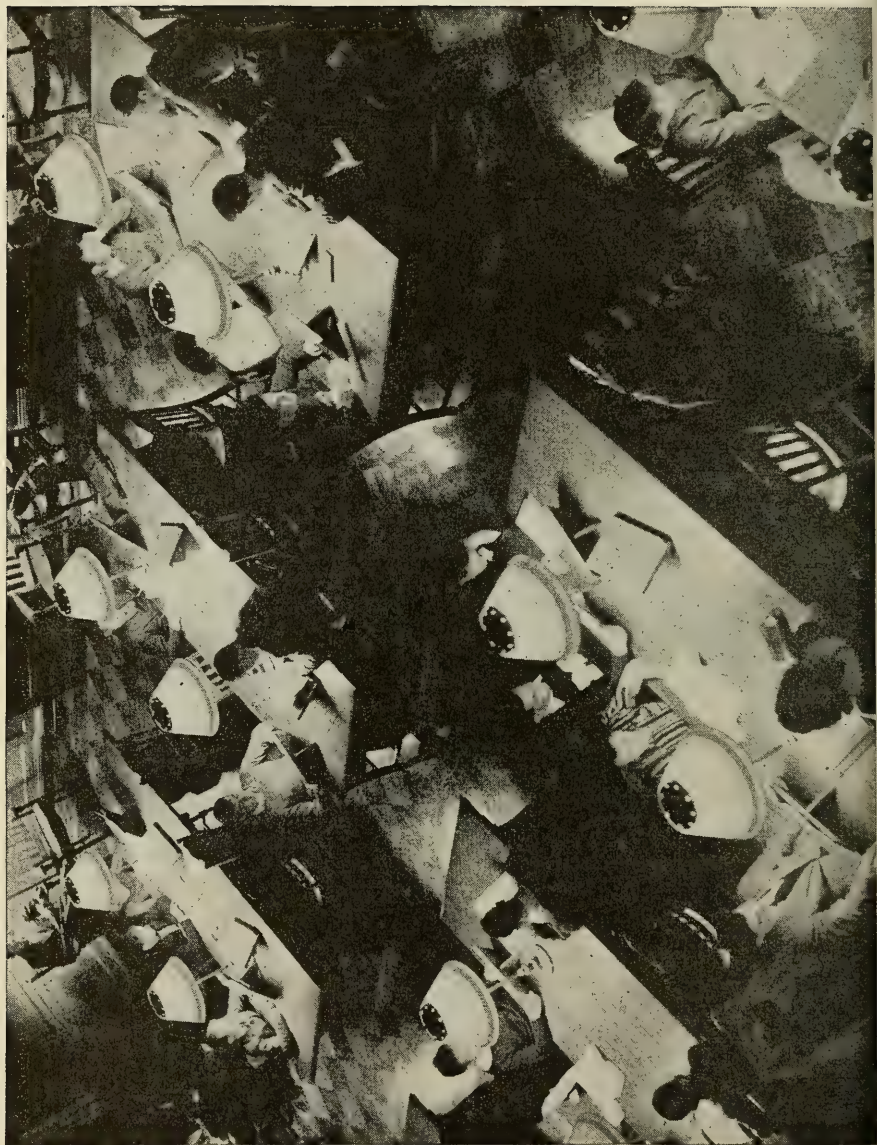
The University endeavors to safeguard the health of all students while on the campus and for this purpose maintains a Department of Student Health, staffed by two physicians, five resident registered nurses, and operates a group of three Infirmary buildings.

- (1) Physical examination by the Health Service is required of all undergraduate students annually, or more often if indicated. This examination is given to freshmen during matriculation week. *Evidence of a successful smallpox vaccination is required.*
- (2) The Student Health physicians have offices in the Physical Education building and in the Out-Patient Building, where they may be consulted during university hours.
- (3) The Infirmary consists of three buildings on East side of campus, near Marshall Hall, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by one of the Student Health physicians.
Out-patient hours are: Week days 9:00-11:30 a.m., 3:00-5:00 p.m. Saturdays 9:00-11:30 a.m.
- (4) Students are urged to consult the resident physicians at the first sign of physical disorder, and for minor accidents. Many severe illnesses and much lost time can be avoided by early or preventive treatment.
- (5) A Trustee ruling grants free time in the Infirmary — when necessary for treatment — up to seven days in the school year. This free time applies to regularly enrolled undergraduate students only. For time in excess of seven days or for other bed patients, a charge of \$4.00 per day is made against the patient.
- (6) In addition to the charges specified in paragraph 5, the following additional expenses will be charged to the patient.
 - (a) *Nurses.* — In case a special nurse is required for the proper care of an individual the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the chief resident nurse.
 - (b) *Professional Service.* — If a student requires continuous medical attention by a physician, he may be required to select a town physician and becomes responsible for fees charged by that physician.
 - (c) *Supplies.* — Special medical supplies prescribed by a physician will be charged to the patient.

GOODELL LIBRARY

This fine building completed in 1935 houses the University Library. This library contains one of the best collections in agriculture and related sciences in the country, with special strength in entomology, botany, chemistry, horticulture, landscape architecture, soil science and animal husbandry, but with large collections, also in literature, history, economics and sociology. There are over 151,000 bound books, and over 50,000 classified pamphlets giving most recent information. The periodical file contains over 800 current magazines, both scientific and popular, and a careful selection of periodical publications of learned societies. The Library is unusually rich in files of journals and publications of Experiment Stations. The Library is open from 7:45 A.M. until 10:00 P.M., Monday through Friday, and from 7:45 A.M. until 5:00 P.M., Saturdays. Sundays the Library is open from 1:45 to 4:45 P.M. and 7:00 to 10:00 P.M.

The building is named in memory of Henry Hill Goodell, President of the University from 1886 to 1904 and Librarian from 1886 to 1898.



LIBRARY READING ROOM

AGRICULTURAL OPPORTUNITIES FOR WOMEN

Agriculture is a field in which women have always found some opportunity. There are women farming independently in all branches of agriculture. As a rule poultry raising, small fruits and vegetable growing and floriculture, seem to offer women an easier opportunity than dairy, stock, and general farming. Women are also occasionally finding some paid positions which include farm and estate workers, and rarely managers. There are from time to time some positions available as garden service workers, and as agricultural officers in state correctional institutions.

For the woman or girl whose home is already upon the farm the opportunity is better. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she may be able to carry on and develop a profitable enterprise of her own. The Stockbridge School of Agriculture offers to the women who wish to engage in farming the practical training which they will need to fit for such work.

Women who are interested in taking agricultural courses should correspond with Miss Carol Gawthrop, Placement Officer for Women.

POSITIONS

The University does not guarantee positions to students registered in any of its courses, but through the Placement Service it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and experience, and of his success in positions for which he has been recommended after he has finished his course. Opportunities for trained men and women, especially those who have had experience, are good.

A student desiring a recommendation from the university must meet the following conditions:—

- (1) He must be of good character.
- (2) His previous record must be good.
- (3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of practical experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

VOCATIONAL PLACEMENT

The work of locating first year students for apprentice training from April to October, after the resident term is completed, is in charge of the Director of Placement Service. Placement training for women students is in charge of Miss Carol Burr Gawthrop of the Placement Office. Every effort is made to secure satisfactory positions affording the kind of training desired by the student, but the Placement Office cannot guarantee to place every student for training, when positions are not available. In normal times placement positions are secured for all students who are eligible under these conditions.

1. Positions are secured that will enable a student to gain practical experience in his particular vocation.

2. A student desiring placement at home may arrange for such assignment if the Director of Placement approves. As a rule, it will be found more desirable for a student to spend this six months away from home even though he plans to be employed there after finishing the course. This statement is based on the experience of students who have already taken the course.

3. If credit is to be secured for the six months' placement training the following rules must be carefully observed.

Rules for Stockbridge Students on Placement

1. The student must interview the Director of Placement early in his first year in order that his qualifications, the type of work he wishes to pursue, and his general fitness may be determined.

2. No final arrangement for placement training may be made by the student himself until the Director of Placement has been consulted.

3. Students are required to complete their period of training without unnecessary absences.

4. No transfers are to be made by a student if he is to receive credit, until permission has been had from the Director of Placement.

5. A position may not be given up by the student until the Director of Placement has been notified.

6. A monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period.

7. Students must satisfactorily complete all reports as required by the various departments.

8. When a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year.

9. All students are given a thorough physical examination by the Department of Physical Education at the beginning of each university year. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate and parents' approval.

It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

THE LOTTA AGRICULTURAL FUND FOR GRADUATES ENTERING AGRICULTURAL PURSUITS

(Prepared by the Lotta M. Crabtree University Committee with the approval of the Trustees of the Lotta M. Crabtree Estate.)

A 1940 decision of the Probate Court of Norfolk County made available the Lotta M. Crabtree Agricultural Funds to graduates of the Stockbridge School of Agriculture, as well as to graduates of the four-year course at the University of Massachusetts. This decision does not, however, lessen the restrictions or change the purposes for which these funds can be used for farm financing.

The purpose of loans from these funds is to assist meritorious graduates who are without means in establishing themselves in agricultural pursuits. These loans are made without interest or service charges other than the cost of title search and legal papers. They must, however, be paid back in full amount within a reasonable length of time and there are certain restrictions on their use.

To avoid disappointment on the part of applicants and save unnecessary work and expense in investigating applications for loans, there are certain questions that the prospective borrower should answer for himself before making application for a Crabtree loan. The more important of these follow.

1. Am I thoroughly qualified, both in training and experience, to successfully manage the project that I am planning? Experience on a farm or in the agricultural enterprise contemplated, in addition to classroom training is one of the first essentials for success. If such experience is lacking, it is usually best to delay application for a loan until acquired.

2. Is the project that I seek assistance in financing really an "agricultural pursuit"?

3. Am I using these funds entirely to establish myself in business or are they being used in part to benefit some other person who is not a graduate of the University of Massachusetts or the Stockbridge School? This question sometimes arises in connection with "family" and "partnership" propositions. It has no reference to a wife or other dependent but no part of the loan can be used to finance a person who is not a University or Stockbridge graduate.

4. Am I using these funds for refinancing present debts? The purpose of these loans is to "establish" rather than "reestablish" persons in agricultural pursuits. They cannot be used for retiring present debts.

5. Will the amount that I can hope to borrow from these funds adequately finance the enterprise that I am planning to engage in? Lotta Agricultural loans are used mostly to supplement other forms of financing rather than for complete financing of farming operations. Reasonably definite plans for the other financing, which the loan is intended to supplement, should be worked out before applying for a Crabtree loan.

6. What can I offer as security to adequately safeguard this loan? A Crabtree loan, like any other loan, should be safeguarded against possible death or financial failure of the recipient. While character and personal integrity of the applicant are large factors in decisions relative to granting of a loan, adequate security should be provided as far as possible.

7. Can I amortize my debt payments and other financial obligations so that I can repay this loan within a reasonable period of time? Most Crabtree loans are made under definite agreement to repay within a relatively short period of years. The Crabtree applicant should therefore make certain, barring calamity, that his income above necessary operating and living expenses will be great enough to allow annual, semi-annual or monthly payments on this loan as well as on other debt obligations that he may be carrying.

8. Will this loan actually help me to make more money or will it merely delay the time and increase the burden of final financial reckoning? The answer to this question and also to No. 7 involves careful budgeting and planning ahead. Unless an applicant can show on paper by carefully projected plans and budgets of expected receipts and expenses that he will benefit by a loan, he is likely to have difficulty in repaying it.

Applications for the "Lotta Agricultural Fund" should be addressed to the Trustees of the Lotta M. Crabtree Estate, 619 Washington Street, Boston, Massachusetts, or may be secured at the Short Course Office or the Placement Office at the University. The Director of Placement has been designated as the Stockbridge representative on the faculty committee which makes approval recommendations to the Crabtree trustees. Decisions regarding the granting of a loan rest entirely with the Trustees under the terms of Miss Crabtree's will.

ANIMAL HUSBANDRY

PROFESSOR RICE, ASSOCIATE PROFESSOR FOLEY, ASSISTANT PROFESSOR COWAN
ASSISTANT PROFESSOR HALE, MR. SWANSON, MR. _____

Animal Husbandry, in this School, refers to the breeding, feeding, and management of dairy cattle, beef cattle, horses, sheep and swine.

The purposes of the courses in Animal Husbandry are (1) to provide the student with a thorough understanding of the basic principles involved in the creation of more efficient and more beautiful animal types, said principles being those involved in the biology of animal reproduction, the chemistry of animal growth and feeding and the economics of livestock production; (2) to show the practical workings of these principles in the selection, feeding and management of the various classes of livestock and (3) to provide practice in judging, fitting, showing and general management of livestock as well as the production of milk and other products, and the slaughtering, curing and marketing of meat products.

The University dairy herd comprises about 150 animals in the Ayrshire, Guernsey, Holstein, Jersey and Milking Shorthorn breeds. In beef cattle, we maintain a herd of Aberdeen-Angus and a herd of Herefords; in sheep, flocks of Southdowns and Shropshires; in swine, a herd of Chester Whites; and in horses, a band of Percheron mares and stallions as well as one stallion and several mares and foals in the light horse breeds. Modern barns house the above animal and modern equipment is available for practice work with them.

The University Farm of about 250 acres is handled primarily as a live stock farm, producing, pasture, hays, silages and some grain for live stock feeding. The farm is equipped with the most up-to-date machinery for agricultural production. The farm and barns are our laboratories, the animals and accessories of our equipment.

The Charles H. Hood Dairy Foundation Prize for Animal Husbandry Senior

The Charles H. Hood Dairy Foundation Prize of \$200 is awarded annually to three seniors who in the judgment of a special faculty committee has made an outstanding scholastic record in this major course and who because of their practical qualifications, personality, and character, seem best qualified for success in this field.

The first prize is \$100, the second \$60, and the third \$40.

Trains for Jobs Like These:

Owners and operators of dairy farms; farm managers; superintendents or foremen; herdsmen in various kinds of livestock enterprises; dairy herd association testers; inseminators in artificial breeding units; businesses allied to agriculture such as farm cooperative fieldmen, sales and service men for feed, fertilizer and farm machinery companies.

Field trips will be required during the two years at an estimated cost of \$4.00 per student.

Special equipment needed for students in Animal Husbandry are: knives, boots and wash suits, at an estimated cost of \$15.

Animal Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S3 (Marketing)
Agronomy S1 (Soil Management)
Animal Husbandry S1 (Principles of Feeding)
Bacteriology S1 (Bacteriology and Rural Hygiene)
Dairy S1 (General Dairying)
Farm Management S3 (Efficiency in Farming Operations)
Hygiene S1 (Required of women students)
Physical Education S1 (Required of men students not participating in football; also required of women students.)
Milking, Harnessing and Teaming
(Practice periods only, by arrangement)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
Agricultural Engineering S4 (Farm Shop)
Agronomy S2 (Fertilizers)
Animal Husbandry S2 (Types and Breeds)
Fruit Growing S10 (General Course)
Poultry Husbandry S10 (General Course)
Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Motors)
 Animal Husbandry S3 (Animal Breeding)
 Animal Husbandry S5 (Farm Meats)
 Business English S1
 Farm Management S1 (Farm Management and Accounts)
 Public Speaking S1
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football)

Electives

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S10 (Farm Structures and Drainage)
 Agronomy S4 (Field Crops)
 Animal Husbandry S4 (Live Stock Production)
 Animal Husbandry S6 (Dairy Cattle and Milk Production)
 Public Speaking S2
 Veterinary Science S2 (Applied Animal Sanitary Science)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

ANIMAL HUSBANDRY S-1. (Principles of Feeding) I.

This course includes a study of the organs of digestion, the digestion and absorption of feeds, the classification and characteristics of the common feed-stuffs, the utilization of feeds in maintenance, growth, fattening; meat, work and milk production. Some time will be spent on the importance of minerals and vitamins. Methods of calculating balanced rations; feeding standards, and feeding practices will be studied.

3 class hours and 1 2-hour laboratory period a week.

Credit, 4.
 MR. SWANSON.

ANIMAL HUSBANDRY S-2. (Types and Breeds) II.

This course considers the origin, history, development, characteristics and distribution of the breeds of cattle, sheep, swine and horses commercially important in the United States. The conditions to which each class of live stock and each breed seem best adapted will be discussed. Laboratory work consists of judging and evaluating as many rings of dairy, dual-purpose, beef cattle, sheep, swine and draft horses as time permits.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.
 MR. _____

ANIMAL HUSBANDRY S-3. (Animal Breeding) I.

This course is planned to acquaint the student with the facts of reproductive physiology, with the facts and theories of modern genetics, and to show how such knowledge may be utilized through genetic analyses, selection, and systems of breeding for the creation of more beautiful and more efficient animal types.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.
 ASSISTANT PROFESSORS COWAN, HALE, MR. SWANSON.

ANIMAL HUSBANDRY S-4. (Live Stock Production) II.

This course deals briefly with the problems of selection, breeding and care of horses, beef cattle, sheep, and swine, with emphasis on their place in New England agriculture. Attention is given to the general situation, equipment, feeding, management problems and disease control. The laboratory periods consist of practice in fitting and showing, shearing, docking and castrating. As a part of the laboratory work, each student will be assigned an animal for fitting and showing in the "Little International" which will be held on a Saturday in March. Trips to other purebred live stock establishments in New England will be required during the semester. The cost of transportation will not exceed \$5.00.

Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2.

3 class hours, 1 2-hour and 1 4-hour laboratory periods a week.

Credit, 5.
 ASSISTANT PROFESSOR HALE, MR. _____

ANIMAL HUSBANDRY S-5. (Farm Meats) I.

This course includes a survey of the packing industry and follows the product (i.e. beef, pork, lamb and veal) from the feed-lot to the consumer's table. Practice is afforded in classifying animals as to market class and grade and in slaughtering, dressing, and cutting beef, pork, lamb and veal. At the end of the course a trip will be taken to several large packing houses in Boston consuming one day and costing about \$10.00. Textbook: Ziegler, "The Meat We Eat."

Special equipment needed for this course includes knives, boots and wash suits, estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

Mr. _____

ANIMAL HUSBANDRY S-6. (Dairy Cattle and Milk Production) II.

For Seniors. —This course treats all phases of dairy cattle production and management. The student is provided with an opportunity to study and seek the solution to the various economic, nutritional, genetic and managerial problems concerned in successful dairying. Lectures will be supplemented with talks by specialists in the various fields. Laboratory will consist of a detailed study of methods used on the university farm, with practice in the various skills necessary for the herdsman or showman.

Trips to purebred live stock farms in the state for the purpose of inspection and advanced dairy cattle judging will be required on five Saturdays during the spring semester. The cost for transportation will not exceed \$15.00.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.

ASSOCIATE PROFESSOR FOLEY, MR. SWANSON.

ANIMAL HUSBANDRY S-8. (Food Management Meats) II.

For Freshmen in the Food Management Course. This course is designed to impart a knowledge of the fundamental principles involved in judging, purchasing, and efficiently utilizing meat and meat products. Laboratories will involve actual slaughtering, dressing, wholesale and retail cutting and preparation of by-products. Judging practice will be secured in a near by packer cooler and at the end of the course a one day trip costing \$10.00 will be scheduled to several large packing houses in Boston. Textbook: Ziegler, "The Meat We Eat." Special equipment needed for this course includes knives, boots, and wash suits—estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

Mr. _____

ANIMAL HUSBANDRY S-9. (Special Dairy Cattle Course) I.

For Dairy Industry, Poultry Husbandry and Fruit Growing Majors. This course considers briefly the origin, history, development, characteristics and distribution of the six major dairy and dual-purpose breeds of cattle. The course will cover the basic principles of dairy cattle feeding, including feeding standards and the calculation of balanced rations. The principles of genetics and the art of breeding better dairy cattle will be emphasized. Management of the dairy herd for the health standpoint and for profitable returns will complete the lecture portion of the course. Laboratories will be devoted to judging, identification of feeds, and various managerial problems. Textbook: Peterson, "Dairy Science."

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

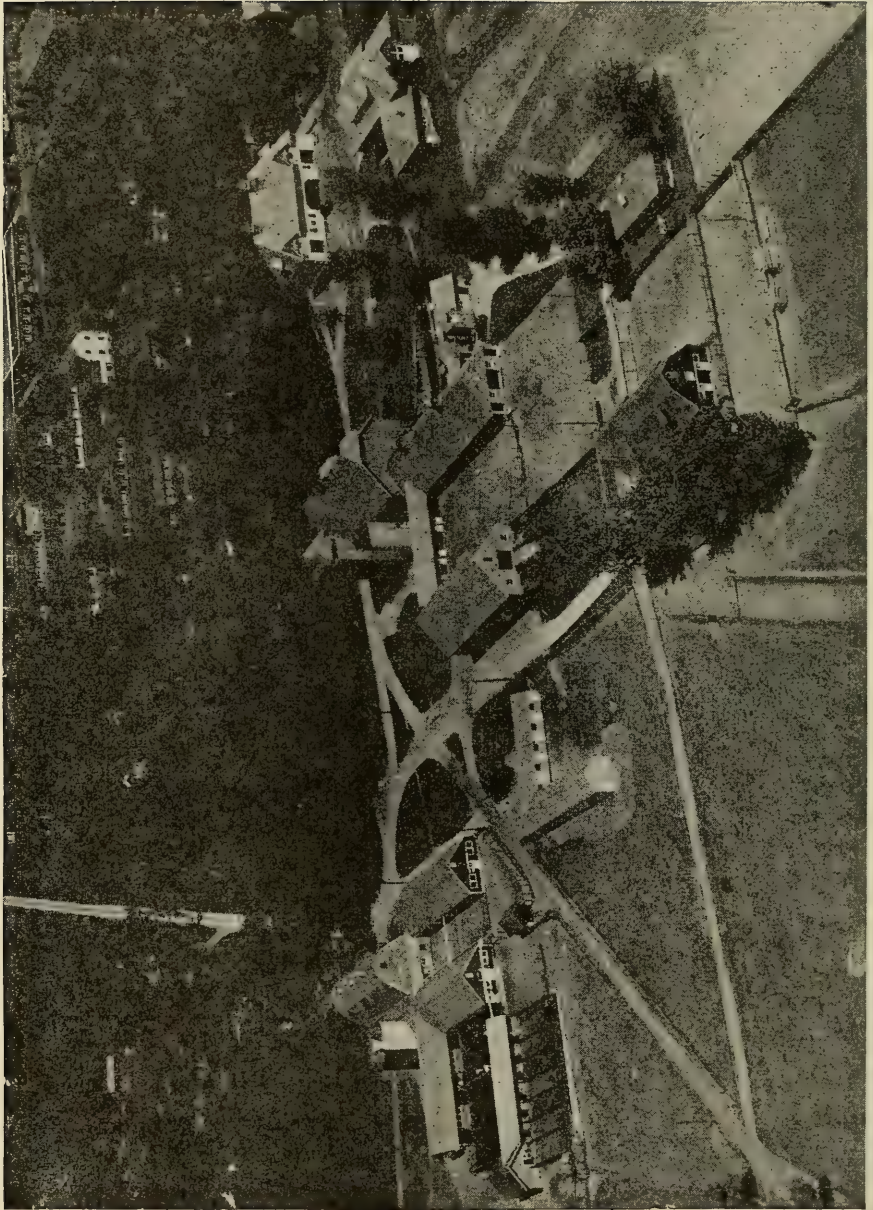
ASSOCIATE PROFESSOR FOLEY.

Note—Every student in this course must qualify in milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

The past 30 years have brought social and technological changes so extensive that they are revolutionizing agricultural production and rural living. The output per person in agriculture in Massachusetts has increased over 50 per cent. In fact, innovations during these years are doing more to increase the efficiency and reduce the cost of farm products, than all the improvements of the previous 300 years put together.

The application of mechanical power to operations relating to land improvement and crop production has increased the output of man's effort tenfold.

These changes have resulted, in large part, from greater emphasis on education and research in agriculture. The net effect of these changes has been to extend the farmers' contacts into new and more complex relationships, and to require progressively higher levels of scientific knowledge and technical ability for successful farm operation. Continued progress must come through even more intensive and widespread education and research in the future. This means opportunity for future generations, properly trained in the sciences relating to agriculture.



DAIRY INDUSTRY

PROFESSOR HANKINSON, ASSISTANT PROFESSOR LINQUIST,

ASSISTANT PROFESSOR NELSON, MR. FINNEGAN

The Dairy Industry course is designed to fit men for positions with market milk concerns, creameries, ice cream plants, and specialized dairy farms.

All dairy industry courses are given in the dairy building (Flint Laboratory), a building devoted especially to dairy work. The building is well equipped with dairy and creamery machinery.

The market milk room contains two complete pasteurizing units, a clarifier, separator, automatic bottle filler and capper, and other necessary equipment for the handling of market milk.

The ice cream making room contains a pasteurizing vat, homogenizer, cooler, brine and direct expansion freezers, continuous freezer, and additional equipment such as is found in ice cream plants.

The room designed for cheese making is equipped with cheese vats, draining racks, presses, etc. The butter making room contains power churns, workers, scales and other accessories.

The separator room contains a collection of separators and other modern equipment and supplies for the dairyman.

The testing laboratories are well equipped with apparatus for the Babcock, mojonner, and other tests used for the determination of fat, acidity, and general cleanliness of milk products.

Trains For Jobs Like These:

Skilled workers in wholesale and retail dairy plants including laboratory technicians, milk plant operators (such as pasteurizer operators, etc.), ice cream plant operators (such as mix makers, freezer operators, fancy form decorators), cheesemakers and salesworkers; also dairy equipment and supply salesmen, fieldmen and Dairy Herd Improvement Association testers. Such training supplemented with sufficient practical experience may lead to positions such as assistant plant superintendents and plant managers.

Field trips will be required during the two years at an estimated cost of \$20 per student.

While working in the dairy laboratories, white suits and rubber footwear are required, at an estimated cost of \$10.00.

Dairy Industry

First Year

First Semester

(Sixteen Weeks Resident Instruction)

Agricultural Economics S1 (Farm Economic Problems)

Agricultural Economics S5 (Dairy Business Accounting)

Agricultural Engineering S1 (Farm Motors)

Bacteriology S1 (Bacteriology and Rural Hygiene)

Dairy S1 (General Dairying)

Practical Science S7

Public Speaking S1

Hygiene S1 (Required of women students)

Physical Education S1 (Required of men students not participating in football; also required of women students).

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)

Dairy S2 (Testing Milk Products)

Food Technology S2 (Basic Principles and Freezing)

Food Technology S4 (Special Products)

Practical Science S8

Public Speaking S2

Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Animal Husbandry S9 (Special Dairy Cattle Course)
 Business English S1
 Business Management S3
 Dairy S3 (Ice Cream Making, Cheese, and other Milk Products)
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S2 (Marketing)
 Agricultural Engineering S6 (Dairy Mechanics)
 Bacteriology S4 (Dairy Bacteriology)
 Dairy S4 (Market Milk and Butter Making)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

DAIRY S-1. (General Dairying) I.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent in fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, Herd Improvement Associations, advanced registry work; the handling of market milk; soft cheese making, ice cream making, and butter making as applied to general farm conditions. The laboratory work consists in testing milk and dairy products for butter fat, solids, and acidity, together with some dairy plant experience in milk handling, butter making, cheese making, and ice cream making.

2 class hours and 1 2-hour laboratory period a week.

CREDIT, 3.

ASSISTANT PROFESSOR LINDQUIST.

DAIRY S-2. (Testing Milk Products) II.

In this course a study is made of the common tests used in dairy industry processes.

The lectures in this course include a discussion of the application of tests, what they indicate and their importance in the dairy plant.

The laboratory work consists of a study of the various dairy laboratory tests such as sediment, flavor, and total solids of milk; moisture fat and salt determination in butter; moisture test of cheese; the operation of the Mojonner tester and the modified Babcock tests for fat in dairy products.

In addition to the testing work students will be required to arrange for work about the plant in order to become familiar with dairy plant practices and the operation of dairy machinery.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR NELSON.

DAIRY S-3. (Ice Cream Making, Cheese, and Other Milk Products) I.

This course deals with the making of ice cream, cheese, condensed, evaporated and powdered milk.

The ice cream making portion of the course includes a careful study of modern methods of manufacturing the common frozen dairy products (ice cream, sherbets, ices, frozen puddings, punches, mousses, etc.).

The lecture work includes a discussion of the history of ice cream making, the ingredients found in ice cream, methods of preparing and standardizing mixes, the freezing process, methods of hardening, marketing, and distribution of the finished product.

The laboratory work involves the preparation and standardization of ice cream mixes, the freezing of ice cream and other frozen dairy products, and laboratory tests for butterfat and total solids in ice cream.

In that part of the course dealing with cheese making, a study is made of the different methods of manufacturing hard and soft cheese (cheddar, brick, cream, neufchatel, olive, nut, cottage, cheese spreads, etc.).

In the lectures the manufacture of the different cheeses is considered, either from the standpoint of marketing the entire milk supply of the dairy or as an economical means of disposing of surplus milk. In the laboratory work the different kinds of cheese are made.

Lectures are also given on the manufacture of the various concentrated products as sweetened condensed, evaporated, and powdered milk; casein, semi-solid buttermilk, dried whey, malted milk, etc.

3 class hours and 3 3-hour laboratory periods a week.

Credit, 8.

ASSISTANT PROFESSOR LINDQUIST, ASSISTANT PROFESSOR NELSON,
and Mr. FINNEGAN.

DAIRY S-4. (Market Milk and Butter Making) II.

In that part of the course on market milk, a study of the development of the market milk industry is made. Attention is given to the necessary essentials in producing a high grade milk; the economics of milk production and distribution; food value and uses; the advantages and disadvantages of cooperative milk producers' organizations; the various methods of marketing milk; the transportation, processing and delivery of milk; manufacture and marketing of surplus milk in the form of by-products as cream, cultured buttermilk, chocolate milk, etc.

The laboratory work consists of receiving and making quality tests on milk and the operation of the machinery used in processing market milk.

The buttermaking portion of the course includes studies of milk separation with the selection, care, and use of separators; the pasteurization and ripening of cream; the making and use of starters; a study of churns and churning; modern methods of making butter; tests for moisture, salt, fat, and curd content of butter.

3 class hours and 3 3-hour laboratory periods a week.

Credit, 8.

ASSISTANT PROFESSOR LINDQUIST, ASSISTANT PROFESSOR NELSON,
and Mr. FINNEGAN.

DAIRY S-6. (General Course for Poultry Majors) II.

This course takes up the importance of dairying in the United States, and especially in the New England States.

Lectures will be given on secretion, composition, and properties of milk, reasons for variation in per cent of butter fat in different samples of milk. The Babcock test for fat in milk, cream, skim milk and buttermilk, the advantages of testing herds, herd improvement associations, advanced registry work; the handling of market milk, soft cheese making, ice cream making, and butter making, as applied to general farm conditions.

The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice cream making.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

MR. FINNEGAN

DAIRY S-8. (Grading and Marketing of Dairy Products) II.

This course is arranged for students specializing in Food Management to provide a basis for the more intelligent selection of dairy products.

It includes a consideration of the composition, food value, selection, and use of the different dairy products; a careful study of the methods of marketing and grading; a survey of processing methods and types of packages; and laboratory practice in testing milk products and in evaluating and identifying eating quality of milk, butter, cheese, and ice cream.

During the semester a trip will be made to leading dairy wholesale markets in Boston, at an estimated cost of \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR HANKINSON, ASSISTANT PROFESSOR NELSON,
and Mr. FINNEGAN.

POULTRY HUSBANDRY

PROFESSOR JEFFREY, PROFESSOR SANCTUARY, ASSISTANT PROFESSOR BANTA,
ASSISTANT PROFESSOR VONDELL

There are excellent opportunities in poultry work for men and women who have had the proper training. Graduates from this department have taken their places as leaders in the industry and have filled them capably. Some of them own their own breeding farms, manage or assist in the management of commercial egg farms, while others are in those industries which are closely allied with the production and marketing of poultry products.

Seven specialized courses and one general course are offered by this department. Those students who specialize in poultry culture take all eight courses. The general course is designed to give the students specializing in other branches of agriculture and horticulture the fundamental principles underlying successful poultry raising when a sideline on the farm.

The facilities for practical instruction in poultry husbandry include quarters and equipment in Stockbridge Hall for efficient classroom teaching and demonstrations.

The University Poultry Farm, our practical laboratory, comprises classrooms and laboratories which provide facilities for practice in incubation, breeding, feeding, fattening, killing, picking, candling and grading eggs, caponizing, judging, sexing, construction of poultry houses and appliances, and other phases of poultry work.

The well-bred flock of about 2,000 adult birds consists principally of White Plymouth Rocks, Single Comb Rhode Island Reds, Barred Plymouth Rocks, Single Comb White Leghorns and New Hampshires. The largest flocks of approximately 150 birds are used primarily for practical experiments and demonstrations in housing, feeding, breeding and management. Equipment includes several types of lamp and mammoth type incubators; many styles of coal and electric brooders and chick batteries for brooding and rearing approximately 5,000 chicks. A flock of several hundred Jersey Buff Turkeys is maintained.

The practical phases of commercial poultry production are stressed in the courses offered.

Trains For Jobs Like These:

Skilled workers on poultry farms, owner operators and managers; poultry breeding farms; operation of incubators and brooders; wholesale and retail poultry meats; testing, grading and packing eggs; poultry cooperative sales work with eggs, dressed and live fowl; salesmen for poultry feeds and equipment; broiler production and day-old chicks; turkey and duck farms, breeding (record of performance) and disease control (Pullorum) field men.

Field trips will be required during the two years at an estimated cost of \$37 per student. All poultry Stockbridge students will be required to make a trip to the Boston Poultry Show which is held sometime during the month of January. Estimated cost \$6.00.

Poultry Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Animal Husbandry S9 (Special Dairy Cattle course)
Bacteriology S1 (Bacteriology and Rural Hygiene)
Farm Management S3
Poultry Husbandry S1 (Judging and Housing)
Public Speaking S1
Vegetable Growing S9 (General Course)
Hygiene S1 (Required of women students)
Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

Four Weeks Resident Instruction Followed by Seven Months Placement Training)
Dairy S6 (General Course)
Poultry Husbandry S2 (Incubation and Brooding)
Poultry Husbandry S4 (Feeding)
Public Speaking S2
Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S1 (Farm Economic Problems)
 Agricultural Engineering S3 (Farm Shop)
 Fruit Growing S9 (General Course)
 Poultry Husbandry S5 (Marketing)
 Poultry Husbandry S7 (Breeding)
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S2 (Farm Motors)
 Agricultural Engineering S8 (Farm Structures)
 Business English S2
 Farm Management S2 (Farm Management and Accounts)
 Poultry Husbandry S8 (Supervised Reading and Management)
 Poultry Husbandry S12 (Specialties)
 Veterinary Science S2 (Applied Animal Sanitary Science)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

POULTRY HUSBANDRY S-1. (Judging and Housing) I.

This course embraces a study of the various economically important types of breeds of domestic fowl, judging for egg production capacity, and for exhibition quality. This course also covers the principles and practices of constructing and equipping houses on a commercial poultry farm. A few trips to nearby poultry plants may be taken to study poultry house ventilation. Two credits for judging; three credits for housing.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.

PROFESSOR SANCTUARY AND ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-2. (Incubating and Brooding) II.

A study of incubation and brooding is made by means of the operation of standard incubators and brooders and through a consideration of basic principles. Students select and grade hatching eggs, operate small incubators and observe mammoth incubators for a period of time. Under supervision each student has charge of a brood of chicks. Each student will be expected to purchase a one-minute clinical thermometer.

The incubation part of the course will consist of three class hours, one laboratory period and one practice period, and will run parallel to the brooding part which will consist of two class hours, one laboratory period and one practice hour. 5 class hours; 2 2-hour laboratory periods and the equivalent of 2 2-hour laboratory periods in incubation and brooding practice. (7 days a week.) Credit, 9.

PROFESSOR SANCTUARY.

POULTRY HUSBANDRY S-4. (Feeding) II.

A study of the scientific principles of nutrition essential to commercial success, with particular emphasis on vitamins. Rations properly balanced for various purposes will be calculated. A comparative analysis of the different methods of feeding is included. Textbook: "Feeding Poultry" by Heuser—Published by John Wiley & Sons.

5 class hours and 1 2-hour laboratory period a week.

Credit, 6.

ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-5. (Marketing) I.

A study of preparing eggs and poultry products to meet the requirements of the northeastern markets. Grades, prices and reports are studied in conjunction with different marketing methods. The laboratories are designed to cover the field of practical grading, internal study, candling and packing of eggs as well as selection, fattening and killing and dressing poultry by the latest approved methods.

A one-half day class trip to Springfield markets in December is required. Estimated cost, \$2.00. Text: Benjamin, Pierce and Termohlen's "Marketing Poultry Products".

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR VONDELL.

POULTRY HUSBANDRY S-7. (Breeding) I.

This course includes the study of the improvement of poultry by means of mass selection, cockerel progeny, flock improvement, and pedigree methods of breeding. Students follow through each step of a pedigree hatch and assist in the selection of the breeders used at the university plant. Basic principles of heredity necessary for an understanding of good breeding practices are studied. A textbook costing \$3.00 to \$4.00 will be required.

4 class hours and 1 2-hour laboratory period a week.

Credit, 5.

PROFESSOR SANCTUARY.

POULTRY HUSBANDRY S-8. (Supervised Reading and Management) II.

Each student will be assigned references in the field in which he is most interested. Oral reports will be required. A major part of the work will be the writing of a term paper and students will be graded on their ability to summarize reference reading and on the neatness of their work. Required day trips totalling three or four days to representative commercial poultry areas are made at an approximate cost of \$25.00 per student. The basic factors essential to a financially successful poultry enterprise are analyzed.

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-10. (General Poultry Husbandry) II.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation; the production of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the study of breeds and varieties, various types of incubators, brooders, brooder-houses, etc. Textbook: Jull, "Successful Poultry Management." Note: Students who take course S-10 must get permission from the Poultry Department to take advanced poultry courses.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

ASSISTANT PROFESSOR VONDELL.

POULTRY HUSBANDRY S-12. (Specialties) II.

Turkeys, ducks, geese, and game birds are considered. Breeding, incubation, feeding, rearing, management, marketing, housing, and disease control methods and practices are studied. Most of the course is devoted to the study of turkeys. Textbook: Jull, "Raising Turkeys," etc.

2 class hours a week.

Credit, 2.

ASSISTANT PROFESSOR VONDELL.



MASSACHUSETTS POULTRY FARMERS IN THE MAKING

ARBORICULTURE

ASSISTANT PROFESSOR MATHIEU

Arboriculture is the care of trees. It includes tree planting; large tree moving; diagnosis and treatment of tree diseases, defects, and mechanical injuries; identification and control of tree insect pests; fertilizing; pruning and repair of storm or otherwise damaged trees; and removal of dead or undesirable trees. A growing appreciation of the value of trees and a demand for a tree maintenance service has led to the development of organizations to supply it. These firms desire trained men. All Massachusetts towns are required to elect tree wardens. The men who accept this responsibility should be trained in the requirements of trees and their care. This course is designed to give this basic training in the care of shade and ornamental trees to supply these needs.

This University offered the first course in the country on shade tree care in 1895, and since then a very high degree of interest in shade trees has been maintained here. Annually in March a school of one week's duration for tree wardens is held on the campus. This school brings together tree wardens and men interested in tree care to discuss their problems. Parts of the program of the school will be of interest to students in this course.

Our large campus has a wide variety of trees of all ages with which the student becomes acquainted, and which also serves as a laboratory for problems similar to those one will have to meet in practice. The research laboratory in shade tree diseases for the state is also located on the campus.

The Massachusetts Arborists' Association and the Massachusetts Tree Wardens and Foresters Association have approved this course as a basic training program.

Those electing Arboriculture must register two weeks prior to the opening of the fall semester for the preliminary training period. Applicants will be notified of the date of registration. This two-week period before the start of regular class work will be used for intensive training in the use of ropes and climbing. Eight hours a day will be given over completely to this purpose. Only those who qualify in this preliminary program will be permitted to take the course in Arboriculture. Those who do not qualify may take the Ornamental Horticulture course.

Trains for Jobs Like These:

Operators, foremen and salesmen for arboriculture firms, utility line clearance foremen, deputy tree wardens and eventually tree wardens in towns and cities, tree care in estates, parks, state highways, college campuses or grounds of other public institutions, developing one's own service organization for the practice of arboriculture.

Recommended clothes for tree climbing: breeches, good heavy workshirts.

All students qualifying will be required to obtain personal tools for cavity work, a hand saw, and a pair of 14" or 16" high top shoes with rubber or composition soles and heels at an approximate cost of \$50.00. These can be obtained through the University Bookstore.

In each of the Arboriculture courses S1, S2, S3, S4, S5, and S6, required trips will be made to commercial operations in various parts of the state, the travel cost to be borne by the student, not to exceed \$10 per semester, or a total of \$40.

Arboriculture**First Year****First Semester**

(Eighteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Agronomy S5 (Construction and Maintenance
 of Fine Turf Areas)
 Arboriculture S0 (Tree Climbing. Special
 Qualifying Course)
 Arboriculture S1 (Practices and Policies)
 Botany S1 (Tree Physiology)
 Horticulture S1 (Plant Materials, Trees)
 Public Speaking S1
 Physical Education S1 (Required of men stu-
 dents not participating in football)

Second Semester

(Eight Weeks Resident Instruction Followed by
 Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Arboriculture S2 (Continuation of S1)
 Botany S2 (Diseases of Trees and Shrubs)
 Entomology S2 (Insects of Ornamental Trees
 and Shrubs)
 Horticulture S2 (Plant Propagation)
 Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Arboriculture S3 (Diagnosis and Control)
 Arboriculture S5 (Shade Tree and Shrub Pests)
 Business English S1
 Forestry S3 (Woodland Management)
 Fruit Growing S9 (General Course)
 Horticulture S3 (Surveying and Mapping)
 Physical Education S5 (Required of men stu-
 dents not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Arboriculture S4 (Diagnosis and Control)
 Arboriculture S6 (Shade Tree and Shrub Pests)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Horticulture S4 (Landscape Construction Prob-
 lems)
 Horticulture S6 (Plant Materials, Shrubs)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

ARBORICULTURE S-0. (Tree Climbing) I.

For two weeks previous to the regular opening of school, all students electing this major will attend a special qualifying course in tree climbing. This course will be conducted on the campus for eight hours each day for two weeks to acquaint the student with ropes, tools, and climbing technique. To be enrolled in the arboriculture major all students must pass this qualifying tree climbing practice.

8 hours a day for two weeks.

ASSISTANT PROFESSOR MATHIEU.

ARBORICULTURE S-1. (Practices and Policies) I.

Factual material covering the phases or types of work; pruning, cabling, bracing, fertilization and line clearance. Laboratory work in the application of class discussion.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR MATHIEU.

ARBORICULTURE S-2. (Continuation of S-1) II.

Soils, their origin, structure and function as pertaining to tree growth and development. Fertilizers, their use, sources, application and functions of their elements in the growth and development of a tree. Cuts and fills and their treatment and cavity treatment.

Street tree planting and maintenance programs following the closing of the regular eight week session. Two weeks of training in tree moving, fertilization, and cabling. During this two weeks training the students will spend all their time in the field. There will be no scheduled classes in any other courses.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR MATHIEU.

ARBORICULTURE S-3 and S-4. (Diagnosis and Control) I. II.

Individual and class assignments of tree problems and practice in applying remedial measures and controls. Reports of assignments and recommendations as to cost and time involved in actual field work.

2 class hour and 8 hours per week in conference and laboratory periods. Credit, 6.

ASSISTANT PROFESSOR MATHIEU.

ARBORICULTURE S-5 and S-6. (Shade Tree and Shrub Pests) I. II.

Recognition of the prevalent shade tree and shrub insects and diseases, their life cycles, control measures, equipment and materials used in control. The lectures and laboratory work in diseases and insects will run concurrently throughout the two semesters of the senior year. Insect and fungus collection of specimens required.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR MATHIEU.

ONE YEAR COURSE IN ARBORICULTURE

ASSISTANT PROFESSOR MATHIEU

A one year course for students who have completed the two-year course in Ornamental Horticulture in the Stockbridge School of Agriculture. For the present, no more than five students will be accepted.

Qualifications: Applicants for this course must have fulfilled the following qualifications: 1. An average of 80 percent or better in their course work. 2. Recommended by conference of Department of Ornamental Horticulture, Arboriculture, and the Director of Short Courses. 3. Arboriculture S-0 (preliminary climbing training) must be taken by arrangement during the second semester of the Ornamental Horticulture senior year.

Certificate: A one-year certificate is granted upon satisfactory completion of the year's work, subject to the scholastic requirement of the School.

Arboriculture**First Semester**

(Sixteen Weeks Resident Instruction)
Arboriculture S1 (Practices and Policies)
Botany S1 (Tree Physiology)
Arboriculture S3 (Diagnosis and Control)
Electives

Second Semester

(Sixteen Weeks Resident Instruction)
Arboriculture S2 (Practices and Policies)
Arboriculture S4 (Diagnosis and Control)
Forestry S4 (Forest Production)
Fruit S4 (Fruit Pests and Spraying)

The elective courses may be taken wherever the department concerned is involved. For veterans the Veterans Administration requirements are 23 class hours per week. Electives chosen must add up to this requirement. Should other courses be added to the Arboriculture Major that are not taken by students in the Ornamental Horticulture major, those courses will also be required for completion of the course.

COMMERCIAL VEGETABLE GROWING

PROFESSOR SNYDER, ASSISTANT PROFESSOR TUTTLE, MR. JOHNSON

There are many opportunities for both men and women who complete the Stockbridge School vegetable growing courses. These include the operation of a market garden, truck crop, or greenhouse business; skilled employees of commercial operators; operators or trained employees in the many types of wholesale and retail marketing; employees in responsible positions on private estates, private and state institutions as well as with commercial companies handling agricultural products such as fertilizers, seed and various supplies and equipment.

The production and marketing of vegetable crops is a highly specialized business involving a background of technical training as well as a knowledge of practical skills. The staff and facilities of the Department of Vegetable Growing are well qualified and adequate to give a thorough training to students in the fundamentals essential to growing, harvesting and marketing the many vegetable crops commonly grown in New England.

In addition to the facilities of the Department, trips will be made to several production areas and markets to observe actual operations.

Trains For Jobs Like These:

Skilled workers on market garden and truck farms, growers of commercial vegetable crops in greenhouses, cold frames, and fields. Operating all types of farm machinery, tractors, cultivators, seeders, both motor and horse-drawn; preparing crops for market, sorting, grading, bunching, packing. Wholesale and retail sales and distribution. Workers for seed-growing firms, plant breeding and field work on testing plots. Operators, owners, managers of vegetable crop farms. State and federal market inspectors on commercial grades and packs. Buyers and inspectors for dehydration and quick freezer plants. Institutional farm managers.

Field trips will be required during the two years at an estimated cost of \$40 per student.

Commercial Vegetable Growing

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Floriculture S3 (Greenhouse Management)
 Fruit Growing S1 (Growing Tree Fruits)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Vegetable Growing S3 (Systematic Vegetable Growing)
 Hygiene S1 (Required of women students)
 Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Floriculture S2 (Greenhouse Construction and Heating)
 Fruit Growing S2 (Orchard and Vineyard Pruning)
 Poultry Husbandry S10 (General Course)
 Public Speaking S2
 Vegetable Growing S2 (Principles of Vegetable Culture)
 Vegetable Growing S12 (Diseases, Insects, and Their Control)
 Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Motors)
 Agricultural Engineering S9 (Drainage and Farm Structures)
 Beekeeping S1 (Fall Management, Wintering, Honey, and Bee Diseases)
 Business English S1
 Fruit Growing S7 (Small Fruits)
 Vegetable Growing S5 (Market Practices)
 Vegetable Growing S7 (Commercial Vegetable Growing)
 Physical Education S5 (Required of men students not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Beekeeping S2 (Spring Management, Pollination and Honey Production)
 Farm Management S2 (Farm Management and Accounts)
 Food Technology S2 (Basic Principles, Freezing, Canning and Pickling)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Vegetable Growing S4 (Vegetable Forcing)
 Vegetable Growing S6 (Marketing Methods)
 Vegetable Growing S8 (Commercial Vegetable Growing)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

VEGETABLE GROWING S-1. (Principles of Vegetable Culture) I.

Lecture periods are devoted to discussions covering certain fundamental principles of plant structure and growth as they influence and regulate commercial vegetable culture. The work in the laboratory includes detailed studies in seedage, plant growing, manures and fertilizers, garden planting, pests, storage and marketing.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-2. (Principles of Vegetable Culture) II.

Lectures are devoted to discussions of the more important environmental factors of the soil and climate which regulate plant growth and reproduction, including water, temperature, light, humidity and wind.

3 class hours a week. Credit, 3.

PROFESSOR SNYDER AND MR. JOHNSON.

VEGETABLE GROWING S-3. (Systematic Vegetable Growing) I.

This course is designed to acquaint the student with the identification, nomenclature and classification of the standard types and varieties of vegetables; judging and exhibiting; seed production and variety improvement work.

1 class hour 2 2-hour laboratory periods a week. Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-4. (Vegetable Forcing) II.

A study of the principles and practices involved in growing, harvesting and marketing of vegetable crops commonly grown in forcing structures, especially tomatoes, cucumbers, lettuce, mushrooms and rhubarb. Discussions will also include the growing and handling of vegetable plants for field setting, in plant houses, hotbeds and cold frames.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-5. (Marketing Practices) I.

A study of the various factors and practices involved in harvesting, preparing for market (bunching, tying, wrapping, waxing), grading, packaging, packages used, brands and inspection of vegetables for various market outlets as well as packing house facilities and storage. Trips to nearby and Boston markets will cost approximately \$10.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR SNYDER.

VEGETABLE GROWING S-6. (Marketing Methods) II.

A continuation of the studies in S-5 covering the marketing of vegetables with emphasis on advertising, salesmanship, roadside markets, wholesale and retail outlets, market reports and transportation by truck, rail and plane.

3 class hours a week.

Credit, 3.

PROFESSOR SNYDER.

VEGETABLE GROWING S-7. (Commercial Vegetable Culture) I.

Problems and practices of the commercial grower are discussed as they involve seedage, planting, cultivation, irrigation, tools, machinery, farm organization, and management.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JOHNSON.

VEGETABLE GROWING S-8. (Commercial Vegetable Culture) II.

This is a continuation of Vegetable Growing S-7 in which the discussions involve the cultural practices for the various vegetables that are of commercial importance in the New England area. Organized trips to market gardening areas are required which cover a period of approximately three days and cost about \$30.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-9. (General Course) I.

This course is designed to meet the needs of students in other majors who cannot devote more than one semester to a study of vegetable growing. Attention is to be given to starting plants early, transplanting, seeding, fertilizing, spraying, dusting, harvesting, marketing, and storing the more important vegetable crops.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JOHNSON.

VEGETABLE GROWING S-12. (Diseases, Insects and Their Control) II.

This course is intended to give those students majoring in vegetable growing an understanding of the more common insects and diseases which attack vegetable plants and the most satisfactory methods for controlling these pests.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

ASSISTANT PROFESSOR TUTTLE.

FLORICULTURE

PROFESSOR THAYER, ASSISTANT PROFESSOR HUBBARD, ASSISTANT PROFESSOR
ROSS, MR. DUNHAM

Students who complete the course in Floriculture are fitted primarily for work in commercial and private estate greenhouse establishments and retail flower stores. After gaining experience such students may be able to start in business for themselves. With the courses in Ornamental Horticulture they should also be qualified for positions on private estates, in parks, or in nurseries.

The offices and classrooms of the Department are located in French Hall. Of the two lecture rooms, one will accommodate 40 students, the other 30 students; a laboratory, equipped with slate-covered tables, will accommodate 36 students; the greenhouse laboratory for 20 students provides excellent facilities for much of the practical work. In the basement of the building there are located a specially prepared room for bulb storage, a fertilizer and tool room, and a large room for general storage purposes.

The glass area of the Department consists of approximately 14,000 square feet divided as follows: (1) the French Hall range of 11,800 square feet, a modern, practical, commercial range including propagating, palm and fern, sweet pea, carnation, rose and student houses; (2) approximately 2,200 square feet in cold frames and hotbeds. In addition, the Department has the use of the materials in the Durfee Plant Houses, an old range of 7,400 square feet, which houses primarily a collection of tropical, decorative, and other conservatory plants.

Land is available for the outdoor culture of florists' crops. A small perennial garden and a small rose garden are also maintained.

Trains For Jobs Like These:

Skilled workers in commercial greenhouses and on private estates, growing all types of flower crops; wholesale and retail florists, growers, salesmen, managers; flower arrangement work, designers and decorators in retail flower stores; salesmen for florists' supplies and equipment.

Students who major in Floriculture are required to purchase in the first semester of the first year, Bailey's Standard Cyclopedia of Horticulture, estimated at \$25.00.

Field trips will be required during the two years at an estimated cost of \$20.00.

Floriculture

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Floriculture S1 (Garden Materials)
Floriculture S3 (Greenhouse Management)
Horticulture S1 (Plant Materials)
Public Speaking S1.
Vegetable Growing S1 (Principles of Vegetable Culture)
Hygiene S1 (Required of women students)
Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
Agronomy S2 (Fertilizers)
Botany S2 (Diseases of Trees and Shrubs)
Entomology S2 (Insect Pests of Ornamental Trees, Shrubs, and Flowers)
Floriculture S2 (Greenhouse Construction and Heating)
Horticulture S2 (Plant Propagation)
Public Speaking S2
Vegetable Growing S2 (Principles of Vegetable Culture)
Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S3 (Farm Shop)
 Business Management S1 (Fundamentals of
 Business Management)
 Floriculture S5 (Commercial Production)
 Floriculture S7 (Flower Arrangement)
 Fruit Growing S7 (Small Fruits)
 Horticulture S7 (Grounds Maintenance)
 Physical Education S5 (Required of men stu-
 dents not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Business English S2
 Floriculture S6 (Commercial Production)
 Floriculture S8 (The Uses of Herbaceous Plants)
 Floriculture S10 (Conservatory Plants)
 Horticulture S6 (Plant Materials)
 Vegetable Growing S4 (Vegetable Forcing)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

FLORICULTURE S-1. (Garden Materials) I.

This course is intended for students who will take up private estate work or who will specialize in floriculture. It includes a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture and uses are considered. Laboratory exercises include work in propagation, planting, study of materials, and planning of beds and borders.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. DUNHAM.

FLORICULTURE S-2. (Greenhouse Construction and Heating) II.

The origin, growth, and importance of the floricultural industry; types of greenhouses, types of construction, painting, glazing, ventilators, beds and benches, and methods of heating: Trips may be taken to visit greenhouse ranges in the vicinity of Amherst with university transportation.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR THAYER.

FLORICULTURE S-3. (Greenhouse Management) I.

A study of the principles of greenhouse management including the consideration of soils, fertilizers, watering, ventilation, temperature regulation, insect and disease control.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSORS HUBBARD, ROSS, AND MR. DUNHAM.

FLORICULTURE S-5 (Commercial Production) I.

Courses S-5 and S-6 are devoted to a consideration of the important commercial crops. Special attention is given to the culture (under glass) of carnations, roses, chrysanthemums, sweet peas and snapdragons. Other cutflower crops and seasonal pot plants are also considered. Modern methods of production including soilless culture and subirrigation practices are discussed in detail.

All members of the class are required to take a one-day trip to visit a large commercial greenhouse range at an approximate cost of \$10.00 each.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR HUBBARD.

FLORICULTURE S-6. (Commercial Production) II.

A continuation of Floriculture S-5.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR HUBBARD.

FLORICULTURE S-7. (Flower Arrangement) I.

The lectures include a discussion of the principles and techniques underlying the use of flowers in corsages, wedding bouquets, vase, bowl, and basket arrangements, table decorations, funeral designs and sprays, and decorations for public functions. The study of color and color harmonies is also considered in this course. The laboratory periods provide opportunity for actual practice in making the various types of arrangements which are considered in the classroom.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR ROSS.

FLORICULTURE S-8. (The Uses of Herbaceous Plants) II.

This course is a continuation of Floriculture S-1 and is intended for students specializing in floriculture and ornamental horticulture. It provides opportunity for a more detailed study of many of the plants considered in the preceding course with special emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens.

Students enrolled in this course may be required to take a one day trip to the Boston Spring Flower Show at an approximate cost of \$10.00.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR HUBBARD AND MR. DUNHAM.

FLORICULTURE S-10 (Conservatory Plants) II.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses and identification of plants are included in the course. Trips may be taken to visit the conservatories at Smith and Mount Holyoke Colleges with university transportation.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR THAYER AND MR. DUNHAM.

FOOD MANAGEMENT

PROFESSOR FELLERS, ASSISTANT PROFESSOR LEVINE, ASSISTANT PROFESSOR
KRANZ, MR. ZALKAN

Food management work in all its various trade sub-divisions is closely allied to food production work. Purchasing agents for wholesale and retail food chains must know vegetables and fruits of all kinds, meats, and dairy products such as milk, butter, cheese and ice cream; poultry products such as fowl, ducks, turkeys, and all kinds of eggs and egg products. This same knowledge of superior grades, varieties, and packs of all agricultural products, as well as the modern methods of cooling, freezing, preserving, processing, and serving, is highly essential to the hotel and restaurant industry for its supply of future managers, stewards, and operators. Lunchroom, tearoom, and all summer resort operators should have thorough training in the procurement of food supplies of superior quality if trade competition and public demands are to be efficiently and economically controlled.

Modern methods of food processing including canning, freezing, dehydration and packaging, place a greater responsibility on institutional buyers. Sound knowledge in food production methods may be considered essential to the complete training of stewards, food managers, and restaurant operators. Railroad and aviation dining service offer large new fields for food management efficiency and service.

Planning of menus and preparation of food is studied and practiced in this course, along with a complete survey of the whole food production program in agriculture. The excellent equipment of the farms, orchards, food, technology laboratories and dining halls, is a major factor for thorough training which this University provides.

This course is sponsored by the Massachusetts Hotel Association and by the Massachusetts Restaurant Association whose members are cooperating in the placement and employment of students and graduates. The Boston Stewards Club has generously donated an annual scholarship prize fund and the state hotel association has established a loan fund for student aid.

The Food Management course is given with the cooperation of the University dining halls under the management of Mr. Walter O. Johnson.

Trains For Jobs Like These:

Assistant cooks, cooks, stewards, in restaurants, cafeterias, hotels, country inns and vacation resorts serving both summer and winter clientele. All New England states have a huge business in their country areas providing home-grown foods and food products for the year-round vacation trade. Many farm homes and boarding houses rely on this type of business for a considerable part of their income. New England foods from shore and farm have earned a distinctive quality which this course seeks to maintain.

For butchering and dressing all kinds of livestock, and preparation of commercial meat cuts and products. For quick freezing all types of farm products for commercial sale or for freezer locker plants, their operation and maintenance. For work in canning and preserving plants.

Field trips will be required during the two years at an estimated cost of \$52.00 per student.

Food Management

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Foods and Nutrition S1 (Basic Principles of Food Preparation)
 General Mathematics S1
 Introduction to Stewarding S1
 Poultry S9
 Practical Science S7
 Public Speaking S1
 Vegetable Growing S5 (Marketing Practice)
 Hygiene S1 (Required of women students)
 Physical Education S1 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction followed by four months Placement Training)
 Agricultural Engineering S12 (Food Handling Equipment) Foods and Nutrition S2 (Meal Preparation and Service)
 Foods and Nutrition S2 (Meat Preparation and Service)
 Food Technology S2 (Basic Principles and Freezing)
 Practical Science S8
 Public Speaking S2
 Quantify Foods S2
 Special Lectures S2
 Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Bacteriology S3 (Food Sanitation)
 Entomology S3 (Structural Pests)
 Foods and Nutrition S3 (Elementary Nutrition)
 Food Technology S5 (Food Manufacturing)
 Fruit Growing S11 (Fruits and Fruit Handling)
 Kitchen Administration S1
 Storekeeping S1
 Physical Education S5 (Required of men students not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S4 (Marketing)
 Animal Husbandry S8 (Food Management Meats)
 Business English S2
 Dairy S8 (Judging, Testing, and Processing of Milk, Cheese, Butter and Ice Cream)
 Food Service S2
 Hotel Accounts S2
 Special Lectures S4

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

AGRICULTURAL ECONOMICS S-4. (Marketing) II.

This course is designed to give instruction in purchasing and in management for Hotel Stewards. A study of the distribution system for food products will be given as well as merchandising practices, store location, advertising and personnel management.

2 class hours a week.

Credit, 2.

PROFESSOR LINDSEY.

AGRICULTURAL ENGINEERING S-12. (Food Handling Equipment) II.

This course covers the mechanical equipment used in hotel management. It includes a study of refrigerators, cleaning equipment, electric ranges, pumps, steam boilers, and miscellaneous steam equipment; and the care and maintenance of electric appliances, including electric motors. Practice will be given in wiring, soldering, and pipe fitting.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. RINES.

ANIMAL HUSBANDRY S-8. (Meats Course) II.

For Seniors in the Food Management Course. This course is designed to impart a knowledge of the fundamental principles involved in judging, purchasing, and efficiently utilizing meat and meat products. Laboratories will involve actual slaughtering, dressing, wholesale and retail cutting, and preparation of by-products. Judging practice will be secured in a near by packer cooler and at the end of the course a one day trip costing \$10.00 will be scheduled to several large packing houses in Boston. Textbook: Ziegler, "The Meat We Eat." Special equipment needed for this course includes knives, boots, and wash suits,—estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR HALE.



A LABORATORY EXERCISE IN FOOD MANAGEMENT—UNIVERSITY CAFETERIA

BACTERIOLOGY S-3. (Food Sanitation) I.

This course includes a general study of micro-organisms responsible for the common diseases of man and the methods employed in their detection and control. It introduces the student to the application of bacteriological principles in the analysis of water, milk and milk products, and other food substances. Bacteria, molds, and yeasts are studied as living agents responsible for the decay, spoilage and infection of foods. The importance of the proper control of these living agents in the production and ripening of certain foods is considered. The conditions necessary for microbial growth and factors responsible for the universal distribution of micro-organisms are studied. The application of sanitation, chemical preservatives and physical and environmental conditions in the control of food infection or spoilage is discussed and demonstrated.

This course is designed to give students interested in the practical problems of food sanitation, spoilage, handling, and preservation a better understanding of bacteria and an appreciation of their importance in the sanitary production and handling of foods.

Laboratory discussions, exercises, and demonstrations.

2 3-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR PERRIELLO.

DAIRY S-8. (Judging, Testing, and Processing of Milk, Cheese, Butter, and Ice Cream) II.

Work will be given on the importance of dairy products—their composition and food value. A careful study will be made of market grades—what they are and how arrived at. Ample laboratory work will be given in judging dairy products, to familiarize the student with the various grades and packs of all dairy products. A special study will be made of practical tests that can be used in determining quality of milk, of ice cream, of cheese, and of butter.

The course will also include a limited amount of practice work in the pasteurizing and processing of market milk, in the making of ice cream, of butter, and of cheese, particularly the soft cheeses, in order to provide a basis for the more intelligent selection of dairy products.

The course is arranged especially for those interested in foods and food processing as applied to hotel and restaurant work.

During the semester a trip will be made to leading dairy wholesale markets in Boston, at an estimated cost of \$10.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR LINDQUIST AND ASSISTANT PROFESSOR NELSON.

ENTOMOLOGY S-3. (Structural Pests) I.

This course is offered during the last eight weeks of the first semester. General introduction to Entomology, followed by studies and discussions of more important pests with which hotel stewards would come in contact.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR SWEETMAN.

FOODS AND NUTRITION S-1. (Basic Principles of Food Preparation) I.

This course aims to teach the basic scientific principles of food preparation. It will include standards for finished products, conservation of nutritive values, foundation recipes, food materials, actual preparation of typical foods and recent developments in food preparation.

2 3-hour laboratory periods a week. (Includes class hour)

Credit, 4.

MISS DAVIS.

FOODS AND NUTRITION S-2. (Meal Preparation and Service) II.

This course is a further study of nutritive value and preparation of food with emphasis on planning, preparation of meals and meal service. Some emphasis is placed upon the organization and executing of chefs' and stewards' duties as they exist in restaurant and hotel set-ups. All food preparation is limited to small quantities. Types of menus will be prepared.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.
MISS DAVIS.

FOODS AND NUTRITION S-3. (Elementary Nutrition) I.

This course is designed to give a general survey of the fundamental principles on which the normal person may plan an adequate dietary. It includes a study of the nutritive value of foods so as to make wise selection possible.

3 class hours a week.

Credit, 3.
ASSISTANT PROFESSOR COOK.

FOOD SERVICE S-2. II.

Kitchen and restaurant equipment, quantity and formula cooking, steward employee relationship, steward-purveyor relationship. Psychology applied to personnel management, conferences, work supervision, advancement, opportunities. Responsibilities of a steward; health and safety sanitation; labor and food laws.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.
ASSISTANT PROFESSOR KRANZ.

FOOD TECHNOLOGY S-2. (Basic Principles, Freezing, Canning and Pickling) II.

Principles of food preservation including refrigeration and modern locker storage management are covered. Work is given in the use of packaging materials and the examination and grading of food products. Three field trips will be required. Estimated cost \$10.00.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.
MR. ZALKAN.

FOOD TECHNOLOGY S-5. (Food Manufacturing) I.

Class work consists of study and laboratory exercises on phases of the food industry of major interest to the students. The studies include food preservation methods, manufacture of carbonated beverages, pickled products, confectionery production and commercial bakery procedures and operations. Some field trips to local commercial food plants will be made.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.
ASSISTANT PROFESSOR LEVINE.

FRUIT GROWING S-11. (Fruits and Fruit Handling) I.

This course is designed primarily for students who are specializing in Food Management. It includes:

1. A study of common varieties of native fruits, citrus fruits, and bananas and the season during which each variety is at its best from the standpoint of the consumer.
2. A consideration of the factors which determine grades of various fruits.
3. A thorough study of storage qualities and methods of storing all fruits commonly used here.

A two-day field trip is a part of the course. Estimated cost, \$10.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.
ASSOCIATE PROFESSOR ROBERTS.

GENERAL MATHEMATICS S-1. I.

This course provides a thorough drill in those fundamentals which are used in practical arithmetic. Fractions, ratio and proportion, percentage, formulas of area and volume, graphs, logarithms, and the use of the slide rule will be studied.

2 class hours a week.

Credit, 2.

HOTEL ACCOUNTS S-2. II.

This course is a continuation of Storekeeping S1 with emphasis on bookkeeping. This will include study of the uniform system of accounts as recommended by the American Hotel Association; food costs and dining room and restaurant accounts.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

INTRODUCTION TO STEWARDING S-1. I.

This course includes the following: Kitchen personnel; list of occupational divisions; duties of individuals; receiving, delivery, and shipping departments; food purchasing; markets; bookkeeping and budgeting; cleanliness and sanitation; duties of storekeeper and assistant steward.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

KITCHEN ADMINISTRATION S-1. I.

The course will be a general study of the various problems arising in the operation of a commercial kitchen. Attention will be given to the planning and equipment of kitchens, food control and costs, and personnel problems. Beverages and their service; planning meals and menus. Field trips are made to near-by kitchens.

2 class hours a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

POULTRY HUSBANDRY S-9. I.

This course covers candling and grading of eggs, market classification, a study of eggs in the local markets, dressing poultry and various ways of preparing poultry for the table. Prices and market operations form an active part of the course.

A one-half day class trip to the Springfield markets in December is required. Estimated cost, \$2.00.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR VONDELL.

PRACTICAL SCIENCE S-7 and S-8. I. II.

This is a course in applied sciences, chiefly in the fields of chemistry and physics, as they are tools serving the needs of the dairy and food industries. In general, the course is designed to give an introduction to scientific thought and phenomena by means of lectures, textbook study and classroom demonstrations. The emphasis is entirely built around the practical problems in the student's field of work.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR EVERSON.

QUANTITY FOODS S-2. (Preparation and Service) II.

This course is planned to give the student an insight into the problems of the kitchen department of the hotel, restaurant or club. Students will be under the supervision of the manager of the Dining Hall and will be apprenticed to the regular employees at the University Dining Hall and will assist the cooks,

baker, stock clerk, etc., during the laboratory periods. The course is planned so that each student will have the opportunity to do actual work in quantity food preparation and service.

2 4-hour laboratory periods a week

Credit, 4.

ASSISTANT PROFESSOR KRANZ.

SPECIAL LECTURES S-2 and S-4. II.

Registration restricted to Food Management students. These lectures will be presented weekly by men within the hotel and restaurant industry and allied professions and by members of the university faculty. They will cover a variety of subjects all of which will be of interest and value to young people planning to enter the hotel and restaurant business.

1 class hour a week.

Credit, 1.

THE DEPARTMENT.

STOREKEEPING S-1. I.

This course aims to give the student an elementary working knowledge underlying the record system for keeping stocks and inventories. This includes receiving and disbursing stocks and records; also, perpetual inventories and food store management; refrigerator and dry storages.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

VEGETABLE GROWING S-5. (Marketing Practice) I.

A study of the various factors concerned with the harvesting and marketing of vegetable produce, including grades, packs, packages, brands, market and inspection requirements.

3 class hours a week.

Credit, 3.

PROFESSOR SNYDER.

About 129,000 citizens of Massachusetts are engaged directly in agricultural pursuits while a slightly larger number are engaged in "allied industries" which aid the farming industry by obtaining farm supplies and services for production, and then provide the services and facilities for marketing the farm products. This means approximately 100,000 jobs. From 3,000 to 5,000 replacements are required every year to maintain the industry.

APPLIED FORESTRY

PROFESSOR HOLDSWORTH, PROFESSOR TRIPPENSEE, PROFESSOR RHODES, ASSOCIATE PROFESSOR RICH, ASSISTANT PROFESSOR STICKEL, MR. MACCONNELL, MR. COLE

The two year course in applied forestry is intended to equip men with a sound understanding of the basic principles of forestry and their vocational application in the field.

The men who elect to take the course should fully understand that the vocation for which they are preparing will involve hard work, much of it physical in character. They should also keep in mind that a man trained in forestry techniques will be in a position to advance through apprenticeship to jobs of genuine responsibility.

There is a definite place in the broad field of forestry for trained workers who are capable of understanding and intelligently carrying out the tasks of a sub-professional character which are so necessary to forest maintenance and development.

Prospective students should have clearly in mind a very definite idea of the occupation they intend to follow upon completion of the course of study described here. Each student should have his own well defined employment goal.

Men who successfully complete the curriculum in applied forestry are qualified for places with timber growing and forest products industries, for supervision of forested estates, watershed properties, town forests and for work with certain public agencies which are concerned with forestry.

Facilities: The University owns 800 acres of woodland which is used for the laboratory and field studies of the Stockbridge School. It has ready access to a very considerable additional acreage in the neighborhood of Amherst.

Placement Training: The program of study and training requires the students of Applied Forestry to spend four months in placement training. The placement jobs in forestry often require the student to work at a considerable distance from this region.

Equipment: The Forestry Department has good technical equipment for field study purposes.

Student Limitation: Each entering class is limited to fifteen men.

Student Needs: In addition to the regular expense of the Stockbridge School, the student must be prepared to buy draughting equipment costing about \$30.00, a hand compass costing about \$7.00, and should be able to take several field trips, the cost of which will be about \$50.00.

APPLIED FORESTRY

First Year

First Semester

(Sixteen Weeks Resident Instruction)

Agronomy S1 (Soil Management)

Forestry S1 (Dendrology)

Forestry S5 (Forest Measurement)

Forestry S7 (Forest Physiology)

Review Mathematics S1

Physical Education S1

Second Semester

(Sixteen Weeks Resident Instruction Followed by Four Months Placement Training)

Business English S2

Forestry S2 (Wood Identification)

Forestry S4 (Forest Draughtsmanship)

Forestry S6 (Forest Measurement)

Forestry S8 (History of American Forestry; Forest Economics)

Electives

Physical Education S4 (Basketball and Hockey)

Physical Education S6 (Baseball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)

Forestry S11 (Silvics)

Forestry S13 (Harvesting)

Forestry S15 (Forest Protection)

Forestry S17 (Library Reading and Reports)

Horticulture S3

Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)

Forestry S10 (Forest Management)

Forestry S12 (Applied Silviculture)

Forestry S14 (Forest Products)

Forestry S16 (Seeding and Planting)

Forestry S18 (Wildlife Management)

Forestry S20 (Forest Insects and Diseases)

Electives

Physical Education S4 (Basketball and Hockey)

Physical Education S6 (Baseball)

FORESTRY S-1. (Dendrology) I.

Features of identification, classification and geographical distribution of the principal trees of North America together with a study of the vegetation regions of the United States and Canada.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

FORESTRY S-2 (Wood Identification) II.

The gross structural and identification features of our most used North American woods. Laboratory practice in wood identification using macroscopic features

2 2-hour laboratory periods a week.

Credit, 2.

FORESTRY S-4. (Forest Draughtsmanship) II.

A course designed to teach the use of draughting equipment for purposes of map, chart and graph making. Instruction in lettering is included.

2 2-hour laboratory periods a week.

Credit, 2.

FORESTRY S-5. (Forest Measurement) I.

Determination of the volume and value of forest growing stock by several approved methods. This involves the making of a chain and compass area survey, type mapping and the use of instruments used in forest estimating and growth studies.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

FORESTRY S-6. (Forest Measurement) II.

Continuation of and development of S-1.

3 class hours a week (or equivalent field work)

Credit, 3.

FORESTRY S-7. (Forest Physiology) I.

The structure and physiological functions of forest trees and other forest vegetation. A classroom course with demonstrations.

3 class hours a week.

Credit, 3.

FORESTRY S-8. (History of American Forestry; Forest Economics) II.

The story of the development of forestry in the United States; The Economics of Forestry.

2 class hours and 1 seminar hour a week.

Credit, 3.

FORESTRY S-10. (Forest Management) II.

The management of American forests; the preparation of operational management plans. Class and field work.

2 class hours and 1 4-hour field period a week.

Credit, 4.

FORESTRY S-11. (Silvics) I.

The forest qualities and requirements of forest trees, including a study of tree-growing site relationships, growth rates, tolerance, temperature, and moisture factors. Special emphasis is laid on the experience of others in the forest use of certain tree species.

3 class hours a week.

Credit, 3.

FORESTRY S-12. (Applied Silviculture) II.

This course considers the several forest reproduction methods, the intermediate cuttings, together with extensive field practice in their application.

1 8-hour field period a week.

Credit, 4.

FORESTRY S-13. (Harvesting) I.

The methods of harvesting forest products with special emphasis on means used in New England. A general survey of methods used in all of the forest regions of the United States.

2 class hours and 1 4-hour laboratory field period a week.

Credit, 3.

FORESTRY S-14. (Forest Products) II.

The properties of American woods. The products of the forest industries.

3 class hours a week.

Credit, 3.

FORESTRY S-15. (Forest Protection) I.

Methods of protecting the forest against fire and other forest-destructive agencies.

3 class hours a week. Field trips by arrangement.

Credit, 3.

FORESTRY S-16. (Seeding and Planting) II.

This course considers the production of forest planting stock in nursery; the characteristics and quality of forest tree seed; artificial reforestation.

1 class hour and 2 2-hour field and laboratory periods a week.

Credit, 3.

FORESTRY S-17. (Library Reading and Reports) I.

Library reading and study on assigned forestry subjects. Designed to develop the ability to analyze forestry material and to abstract it clearly and concisely.

2 hours general seminar. Individual Conferences.

Credit, 3.

FORESTRY S-18. (Wildlife Management) II.

Effects of animals on the forest; and the effects of forest practices on wild animal production.

3 class hours a week.

Credit, 3.

FORESTRY S-20. (Forest Insects and Diseases) II.

A study of the characteristics of the principal forest insects and diseases and the nature of the damage they inflict or the good that they do in the forest.

3 class hours a week.

Credit, 3.

REVIEW MATHEMATICS S-1. I.

A course intending to bring into sharp focus the simple mathematics which is used in vocational forestry and without which such forestry cannot be intelligently practiced. Arithmetic, plane geometry and certain vocational uses of trigonometry are taught.

3 class hours a week.

Credit, 3.

Although Massachusetts is predominately an urban-industrial state with 90 percent of its people living in towns and cities, agriculture is one of the top three industries of the State.

Ninety-five percent of Massachusetts' land area is open rural countryside. Ten percent of our population (about 430,000) live comfortably in these areas. About one-third of these rural folks (141,000) live on the 30,000 farms and depend upon agricultural production as the principal source of income.

The Massachusetts farm industry represents an investment in land, buildings, equipment and live stock of over 300 million dollars. Its gross income for 1946 was approximately 175 million dollars.

FRUIT GROWING

PROFESSOR FRENCH, ASSOCIATE PROFESSOR ROBERTS, ASSISTANT PROFESSOR
ANDERSON, MR. JAMES ANDERSON

The course in Fruit Growing prepares the student for successful participation in the activities of our many sided fruit industry. An essential practical course, it emphasizes also the basic principles of plant growth which underlie sound cultural practices and the economic principles which bear upon marketing procedures and the business side of fruit growing. It provides a foundation on which increasing effectiveness may be developed through continued practical experience.

The University has about fifty acres of fruits easily reached from the classroom, and they are used freely for purposes of illustration and study. Most of the tree and small fruits commonly found in New England are grown here on a commercial scale. Many experiments and tests are in progress in the plantations, offering exceptional opportunities to the student for the practical study of plant reactions under many and varied conditions. Excellent commercial orchards near the campus provide a wealth of additional material for observation and study. Large markets are visited to afford valuable contacts with the main channels of crop distribution.

Equipment for instruction includes a modern storage and packing house in which there are several types of refrigerated and common storage, a quick freezing unit, and zero temperature holding rooms. all in operation within the University year. The principal types of orchard tools and machines, such as tractors, plows, harrows, cultivators, sprayers, dusters, and pruning and grafting tools are available for study and trial by students. Emphasis is placed on life histories and methods of control of all important insect, fungus and other pests. Materials used in pest control are studied in great variety.

Graduates of the course in Fruit Growing are found in positions of responsibility all over the Northeast. Some have established successful fruit farms of their own. Others, after gaining added practical experience, have risen to positions as managers or foremen in large orchards. Still others have entered the industrial field and are employed by supply and equipment firms or are engaged in marketing activities. Fruit Growing is an active and thriving industry which offers a field of continuing interest and many opportunities for profitable development to the earnest student.

Combination Courses: Fruit growing lends itself readily to combination with other branches of agriculture. The fruit course is already broad and includes most of the information likely to be needed by the student, but for special interests the following are suggested: Fruit Growing and Beekeeping, Fruit Growing and Live Stock, Fruit Growing and Poultry, Fruit Growing and Vegetable Growing, or small fruits with Floriculture or any of the above subjects.

Trains for Jobs Like These:

Skilled workers on fruit farms, operators, foremen, owners; packing house operators, managers of sales and distribution. Salesmen for commercial spray materials, orchard equipment, and fertilizers; fruit inspection and grading. Growers of specialty fruit crops.

Field trips will be required during the two years at an estimated cost of \$25 per student.

Fruit Growing**First Year****First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Motors)
 Agronomy S1 (Soil Management)
 Forestry S3 (Woodland Management)
 Fruit Growing S1 (Growing Tree Fruits)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Hygiene S1 (Required of women students)
 Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agricultural Engineering S14 (Repair of Farm Equipment)
 Agronomy S2 (Fertilizers)
 Fruit Growing S2 (Orchard Pruning)
 Public Speaking S2
 Poultry Husbandry S10 (General Poultry Husbandry)
 Physical Education S2 (Required of women students)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S1 (Farm Economic Problems)
 Agricultural Engineering S9 (Drainage and Farm Structures)
 Beekeeping S1 (Fall Management, Wintering, Honey, and Bee Diseases)
 Business English S1
 Fruit Growing S5 (Harvesting, Packing, Storage and Marketing)
 Vegetable Growing S7 (Commercial Vegetable Culture)
 Physical Education S5 (Required of men students not participating in football)

Elective

Physical Education S3 (For women)

Second Semester

(Sixteen Weeks Resident Instruction)
 Beekeeping S2 (Spring Management, Pollination and Honey Production)
 Farm Management S2 (Farm Management and Accounts)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Fruit Growing S6 (Advanced Fruit Growing)
 Fruit Growing S8 (Small Fruits)
 Vegetable Growing S6 (Marketing Methods)
 Vegetable Growing S8 (Commercial Vegetable Culture)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

FRUIT GROWING S-1. (Growing Tree Fruits) I.

This course covers the planting and development of orchards and the management of bearing trees. The nature of the tree itself is stressed as the basis of sound cultural practices. The selection of sites and soils and varieties is studied for plantations of apples, pears, peaches, plums, and cherries. The handling of young trees to bring them into early profitable bearing is given special attention.

The culture of bearing orchards is studied in detail to give an understanding of the factors that influence yield and quality of fruit. Methods of soil management are considered with reference to their long-time effects on tree and soil. The experimental plots afford exceptional opportunities to study cultural methods and many subjects are discussed in the orchards.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR FRENCH AND MR. JAMES ANDERSON.

FRUIT GROWING S-2. (Orchard Pruning) II.

This course aims to give the student a thorough training in the underlying principles and the practice of pruning apples, pears, peaches, cherries and plums. The bearing habit of each fruit is studied as a basis for effective pruning. Practice pruning in the University orchards is stressed as an important feature of the course. Instruction and practice in budding and grafting are included in this course. Bridge grafting and top working are given special attention.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS AND MR. JAMES ANDERSON.

FRUIT GROWING S-4. (Fruit Pests and Spraying) II.

This course deals with the characteristics and behavior of insect and disease pests which attack fruit plants. Particular attention is given to the vulnerable points in their life cycles at which control measures are directed. A study of the principal spray materials and their uses is an essential part of the course.

The construction and care of spraying and dusting equipment is emphasized and students are required to use various types of implements in spraying and dusting trees in the orchard.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-5 (Harvesting, Packing, Storage, and Marketing) I.

Handling the crop from tree to consumer is the field covered by this course. Methods of harvesting and appliances used are studied in the orchards. Practice in packing the most popular containers forms a prominent part of the laboratory work.

The principles of common and refrigerated storage are considered in detail and storage house construction is discussed with a critical examination of several storages in use on or near the campus. Marketing methods as they relate both to distant and to local markets are given special consideration. A two-day field trip is a part of the course. Estimated cost, \$10.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS.

FRUIT GROWING S-6. (Advanced Fruit Growing) II.

This course involves a critical study of tree behavior as a basis for orchard management. Information acquired in other courses and in placement training is brought to bear on important orchard problems. It is the aim of the course to familiarize the student with conditions under which fruit must be grown here, with current thought on the more recent developments, and with adjustments which are being made in the fruit industry of the Northeastern States.

Each student must be prepared to take one or more trips to prominent orchards or to leading fruit sections of the Northeast. Estimated cost, \$15.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS.

FRUIT GROWING S-7. (Small Fruits) I.

This course is similar to Fruit S-8, but is given for students majoring in fields other than Fruit Growing.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-8 (Small Fruits) II. (For Fruit Majors Only)

There are many unusual opportunities in Massachusetts for success in growing small fruits. This course deals with the establishment and management of plantations of strawberries, raspberries, blackberries, blueberries, currants, cranberries, and grapes. The aim is to make the course of the utmost practical value as well as to give an understanding of the fundamental principles on which practices are based.

The University has plantations of these fruits except cranberries which are used freely for laboratory purposes. Berries which ripen in summer are frozen and held in excellent condition for study in this course.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-9. (General Course) I.

This course is intended to meet the needs of students in other majors who can devote one semester only to the subject of Fruit Growing. It deals with the practical side of growing tree and small fruits for home use and market.

Special attention is given to such questions as selection of sites, choice of varieties, grafting, pruning, spraying, soil management, harvesting, and storing. (Horticulture and Poultry majors.)

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JAMES ANDERSON.

FRUIT GROWING S-10. (General Course) II.

This course is a repetition of Fruit Growing S-9 primarily for the benefit of first year students who are specializing in Animal Husbandry.

4 class hours and 1 2-hour laboratory period a week.

Credit, 5.

MR. JAMES ANDERSON.

To provide food enough for only "fairly adequate diets" for all of the people of the United States 10 years hence, would require as many poultry products as are now produced, more fruits, 50 percent more vegetables and a third more dairy products. Per capita consumption of these commodities is increasing. Fortunately these are the important farm products produced in Massachusetts.

Massachusetts farmers are producing more now than ever before,—in their 327 years of history. Whether or not Massachusetts agriculture will continue to expand and prosper with the increasing demands for our products, depends upon our ability to increase farm production efficiency through research, education, and the adoption of improved practices such as animal breeding and feeding, plant breeding and fertilization, saving labor, and raising part of our own feed nutrients through improved hay and pasture production.

ORNAMENTAL HORTICULTURE

PROFESSOR BLUNDELL, MR. PROCOPIO. MR. DURELL

The constantly increasing interest in development of grounds, both public and private, for use and enjoyment, has created a demand for men trained to handle the varied problems in the construction and maintenance of these grounds. The course in Ornamental Horticulture aims to make the student familiar with these various problems.

Men who have taken this course are to be found in such different jobs as foremen in nurseries, or proprietors of nurseries which they themselves have developed; superintendents on private estates, cemeteries, parks, and various public and private institution grounds; foremen for landscape construction firms, and some have organized their own business in landscape construction and grounds maintenance service.

With the whole campus as a laboratory, the student every day finds problems about him comparable to those he will meet when he goes out to work. The broad lawns, the walks and drives, the gardens, the greenhouses, the orchards, the vegetable plots, as well as the farms, supply all the various phases of work which will be encountered on estates, in parks, or in institution ground of plant knowledge; in identification; in propagation which is carried on what these problems are and to solve them himself under expert supervision.

On the campus is to be found a large and excellent collection of mature trees, shrubs, and vines. From these plants the student is able to build up a background of plant knowledge; in identification; in propagation which is carried on in a special greenhouse for the purpose; in the handling of plants in various stages of their growth, in the nursery and on the campus; and in their ultimate care, pruning and protection against injuries of all kinds. Construction of roads, walks, drainage and other problems involving the moving of earth are especially valuable to those looking forward to landscape construction.

Trains For Jobs Like These:

Skilled workers in plant nurseries; gardeners, foremen or superintendents on private estates, public parks, cemeteries, and various public and private institution grounds such as state and government cantonments and hospitals, colleges and private schools; workers or foremen with landscape construction companies, real estate developments; owners and operators of small landscape maintenance businesses and nurseries, salesmen for seed and nursery concerns, plant propagators, town or city watershed foresters, botanic garden foremen.

Special requirements for students in Ornamental Horticulture are: Bailey's Standard Encyclopedia of Horticulture estimated at \$25, and a draftsman's set estimated at \$25.

Field trips will be required during the two years at an estimated cost of \$20 per student.

Ornamental Horticulture

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Agronomy S5 (Construction and Maintenance of Fine Turf Areas)
 Floriculture S1 (Garden Materials)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Hygiene S1 (Required of women students)
 Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Botany S2 (Diseases of Trees and Shrubs)
 Entomology S2 (Insect Pests of Ornamental Trees, Shrubs, and Flowers)
 Horticulture S2 (Plant Propagation)
 Public Speaking S2
 Vegetable Growing S2 (Principles of Vegetable Culture)
 Physical Education S2 (Required of women students).

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Floriculture S3 (Greenhouse Management)
 Forestry S3 (Woodland Management)
 Fruit Growing S9 (General Course)
 Horticulture S3 (Surveying and Mapping)
 Horticulture S7 (Grounds Maintenance)
 Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Floriculture S8 (The Uses of Herbaceous Plants)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Horticulture S4 (Landscape Construction Problems)
 Horticulture S6 (Plant Materials)
 Horticulture S8 (Grounds Maintenance)

Electives

Physical Education S4 (For women)
 Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

Elective

Physical Education S3 (For women)

HORTICULTURE S-1. (Plant Materials) I.

Study of evergreen and deciduous trees used in landscape work, their distinguishing characters, and culture, with special reference to nursery and planting practice.

1 class hour and 2 2-hour laboratory periods a week.

- Credit, 3.

PROFESSOR BLUNDELL.

HORTICULTURE S-2. (Plant Propagation) II.

This course will present the principles of plant propagation with special reference to their application to plant materials in nursery and greenhouse practice. The lectures are concerned with careful explanation of seedage, cuttage, graftage, layerage and division. In the laboratory the student propagates plants by each of these methods.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

MR. PROCOPIO.

HORTICULTURE S-3. (Surveying and Mapping) I.

Practice in the use of simple surveying instruments as tapes, compasses and levels used in the measurement of land surfaces, and the application of these instruments in landscape construction.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. DURELL.

HORTICULTURE S-4. (Landscape Construction Problems) II.

Continuation of Horticulture S-3, including the reading of landscape plans, figuring construction cost on grading work and garden construction problems, and setting stakes for landscape development from working drawings.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. DURELL.



ORNAMENTAL HORTICULTURE

. HORTICULTURE S-6. (Plant Materials) II.

Study of shrubs, both evergreen and deciduous, woody vines, to enable the student to recognize the plants used in ornamental plantings and to familiarize him with the handling of these plants both in nursery practice and landscape work. A two-day field trip will be required. Estimated cost, \$10.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR BLUNDELL.

HORTICULTURE S-7. (Grounds Maintenance) I.

A course based upon the formulation and study of a work program which considers those essential operations contributing to successful horticultural management of grounds. The care of woody ornamental plants is included under the following heads: planting, pruning, maintenance of soil fertility, winter protection, and pest control.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. PROCOPIO.

HORTICULTURE S-8. (Grounds Maintenance) II.

A continuation of Horticulture S-7, taking up spring practices in grounds maintenance and nursery culture. Laboratory work emphasizes the development of supervisory capacity. First half of semester will be devoted to lectures and report work; the last half to lecture and laboratory work.

3 class hours a week, first half of semester.

1 class hour and 1 4-hour laboratory period a week. last half of semester.

Credit, 3.

MR. PROCOPIO.

TURF MAINTENANCE

ASSOCIATE PROFESSOR DICKINSON, MR. CORNISH

There is an immediate need for skilled supervisors and assistants to park, cemetery, and recreation area superintendents. Municipal and private golf clubs are expecting that their superintendents shall be trained in turf maintenance. Every city and large town offers splendid opportunities for the private business horticulturist who is especially well trained to "take care of the lawn."

As the many proposed memorial parks, play fields, public buildings and golf courses are being constructed and completed, the demand for specialists in turf maintenance will be increased and the number of replacements needed annually will be large.

This course is arranged and taught in such a manner that a student who has completed the work will be well qualified to accept a position as assistant or the actual superintendency of a small park, cemetery, or golf course, or to establish a business in his community.

Laboratory and field exercises give practical experience and demonstrations. Good equipment is supplemented by loans from manufacturers and supply houses. The supporting courses are strong and have been carefully chosen for their close alliance to the problems of turf maintenance and general estate work.

Each student's placement training and special interest will be considered in his chosen field, whether it be park, cemetery, golf course, or private business, and professional men will visit the classes to give of their experiences. Every student will be required to keep a record of work done, results obtained, and observations made during the placement training period, for use during the senior year.

Positions Capable of Holding at Graduation:

Assistant to superintendents or as an actual superintendent on golf course, cemetery, a park, or with a commercial nursery or landscape service company, also with golf course construction companies and equipment supply dealers.

At least one field trip will be required during the second semester of the senior year. The total cost of such a trip or trips to each student will not exceed \$20.00.

Turf Maintenance

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Agrostology S1
 Agrostology S3 (Uses and Requirements of Turf Areas)
 Floriculture S1 (Garden Materials)
 Horticulture S1 (Plant Materials)
 Public Speaking S1
 Physical Education S1 (Required of men students not participating in football)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Agrostology S2 (Construction of Turf Areas)
 Agrostology S4 (Maintenance of Turf Areas)
 Botany S2 (Diseases of Trees and Shrubs)
 Entomology S6 (Turf Insects)
 Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S3 (Farm Shop)
 Agrostology S5 (Application of First Year Courses)
 Agrostology S7 (Disease Controls)
 Arboriculture S1 (Lectures)
 Business English S1
 Horticulture S3 (Surveying and Mapping)
 Horticulture S7 (Grounds Maintenance)
 Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S2 (Motors)
 Agrostology S6 (Turf Maintenance as a Business)
 Agrostology S8 (Layout and Construction of Turf Areas)
 Arboriculture S2 (Lectures)
 Floriculture S8 (The Uses of Herbaceous Plants)
 Horticulture S4 (Landscape Construction Problems)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

AGROSTOLOGY S-1. I.

This course provides a background for the succeeding courses. The numerous aspects that enter into professional turf growing are introduced and correlated with each other and the actual growing of grass.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-2. (Construction of Turf Areas) II.

Construction of turf areas. Influence of foundation, subsoil, and topsoil zones. Talks preliminary to placement training. Adaptation of Agronomy S-1.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-3. (Uses and Requirements of Turf Areas) I.

Uses and requirements of turf areas. Grass seed and plant characteristics, identification and adaptation. Germination of seeds and growing of plants.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-4. (Maintenance of Turf Areas) II.

Maintenance of turf areas. Fertilizing, weeds, clipping and watering, with practical work and problems. Adaptation of Agronomy S-2.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-5. (Application of First Year Courses) I.

Thorough resume of the summer work by students, discussing labor, operations, equipment, and results. Application of first year courses.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-6. (Turf Maintenance as a Business) II.

Turf maintenance as a business. Costs, purchasing and reports.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-7. (Disease Controls) I.

Diseases, weeds, and insect pests, with their controls.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-8. (Layout and Construction of Turf Areas) II.

Construction of recreational areas, athletic field, airports, and cemeteries is studied in detail from the turf viewpoint. The design of golf courses is introduced. Contracting law and financing of turf construction contracts are discussed.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

RELATED SUBJECTS IN OTHER DEPARTMENTS

AGRICULTURAL ECONOMICS S-1. (Farm Economic Problems) I.

The purpose of this course is to introduce students to the more important economic problems facing New England farmers. Increasing competition with other farm sections, long-time movements of farm prices and farm profits, farm credit, farm taxation; tariffs and other farm relief measures are some of the problems to be considered.

2 class hours a week.

Credit, 2.
MR. CALLAHAN.

AGRICULTURAL ECONOMICS S-2 and S-3. (Marketing) I. II.

This course deals largely with economic problems arising out of marketing farm products. Particular attention is given to marketing methods used in New England and to the comparison of local methods with methods used by farmers in competing sections. Principles and methods of co-operative marketing used by successful co-operative associations are studied in detail in order to show how New England farmers may meet competition from associations in other sections, either as individual producers or as officers or members of local associations.

2 class hours a week.

Credit, 2.
MR. CALLAHAN.

Instruction in agricultural economics is given with a view toward presenting the business side, or economics of agriculture. The required course is divided into two parts given in separate semesters. The approximate division of subject matter for each semester is indicated.

AGRICULTURAL ECONOMICS S-5. (Dairy Business Accounting) I.

Business arithmetic and bookkeeping are given consideration. The mathematics of fat determination, ice cream mixes, etc., are studied. An understanding of elementary bookkeeping principles involved in milk distribution also forms a part of the course.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.
THE DEPARTMENT.

AGRICULTURAL ENGINEERING S-1 and S-2. (Farm Motors) I. II.

This course is a study of the principles of the gasoline engine and its accessories, as used in trucks, automobiles, tractors, and stationary work. Instruction is given in the laboratory by lectures, demonstrations, and exercises. This course also deals with the application of electricity to agriculture including electric motors.

3 2-hour laboratory periods a week.

Credit, 3.
ASSISTANT PROFESSOR TAGUE AND MR. RINES.

AGRICULTURAL ENGINEERING S-3 and S-4. (Farm Shop) I. II.

This course gives instruction in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Practice in building forms, mixing and placing concrete, framing, cutting rafters, etc., make up this portion of the subject. Instruction in welding, pipe fitting, soldering, arc and gas welding, and the use of machinists' tools for the repair of farm machinery and miscellaneous farm equipment, together with a study of pumps and water supply systems, make up the other portion of the work.

3 2-hour laboratory periods a week.

Credit, 3.
ASSISTANT PROFESSOR BECK AND ASSISTANT PROFESSOR PUSHEE.

AGRICULTURAL ENGINEERING S-6. (Dairy Mechanics) II.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. It includes a study of steam boilers, pumps, steam traps, water filters and softeners, belting, electric motors, milking machines, and refrigeration plants.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR TAGUE.

AGRICULTURAL ENGINEERING S-8. (Farm Structures) II.

A study of building materials, details of construction, simple structural mechanics, and the principles of design applied to farm buildings is made. Each student will design in detail one of the major farm buildings in which he is particularly interested.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR STAPLETON.

AGRICULTURAL ENGINEERING S-9 and S-10. (Farm Structures and Drainage) I. II.

A study of building materials, details of construction, simple structural mechanics, and the principles of design applied to farm buildings is made. Each particularly interested.

About one-fourth of the time will be given to the study of land drainage and practice in the use of the engineer's level for the purpose of laying out and grading of drainage ditches.

1 class hour and 3 2-hour laboratory periods a week.

Credit, 4.

ASSOCIATE PROFESSOR MARKUSON.

AGRICULTURAL ENGINEERING S-14. (Repair of Farm Equipment) II.

Instruction is given in welding, pipe fitting, soldering, gas and electric welding, and the use of machinists' tools for the repair of farm machinery and miscellaneous farm equipment, together with a study of pumps and water systems. (Fruit Growing majors.)

3 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR PUSHEE.

AGRONOMY S-1. (Soil Management) I.

Every agricultural interest is vitally concerned with the soil, its adaptations and its management for plant production. This course treats of the selection of suitable soils for the special purposes of agriculture, horticulture and floriculture.

Laboratory includes training in the use and interpretation of the maps of the U. S. Soil Survey and in tests of soil texture, organic matter and soil acidity. Practical field work will be given in judging the crop adaptation and value of soils.

As a field project the student will be required to make a study of some farm, nursery or florist's plant, from the standpoint of soil conditions and methods of soil management in relation to the enterprise as a whole.

2 class hours and 1 3-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR THAYER AND MR. ZAK.

AGRONOMY S-2. (Fertilizers) II.

This course deals with the origin, manufacture, purchase and use of commercial fertilizer materials. A study will be made of the interpretation of fertilizer formula, analysis and guarantee. Special attention will be given to the newer concentrated fertilizer materials and to those produced from atmospheric nitrogen. The laboratory work will give practice in the identification of fertilizer materials, in the calculation of fertilizer formulas, and in the preparation of fertilizer mixtures.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR THAYER AND MR. ZAK.

AGRONOMY S-4. (Field Crops) II.

The lecture hours of this course will be devoted to presentation and discussion of the most successful methods of fertilizing, cultivating, harvesting, and storing the field crops grown in New England. Special attention will be given to the choice of the best adapted varieties for the production of hay, pasture, corn, potatoes, and root crops.

The laboratory work will include the study of corn and potato varieties, identification of grass and weed species, and studies of purity and germination. Field observations of growing crops will be included as the season permits.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR THAYER.

AGRONOMY S-5. (Construction and Maintenance of Fine Turf Areas) I.

At the completion of this course the student should have a knowledge and appreciation of the requirements for the growing of lawns and sports turf.

He will have considered the construction of turf areas; seed identification, selection and sowing; the identification of turf grasses and their soil and fertilizer preferences, correct cultural practices, turf diseases and pests and their control.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

BACTERIOLOGY S-1. (Bacteriology and Rural Hygiene) I.

The reproduction, structure, growth, changes produced by the action of bacteria upon various substances and the methods by which disease producing bacteria of man and animals are disseminated will be studied. The proper use of disinfectants, vaccines and serums in the control and treatment of disease will be discussed. The purpose of the course is to present the problems of applied bacteriology in health, agriculture and industry. The sanitary production, handling and distribution of milk involving human and environmental contacts with a food often consumed raw is an important problem to be controlled by responsible citizens of the community. Discussions on milk include the various sources of milk infections, methods of controlling sanitary production and marketing and the detection and elimination of milk dangerous to the public health.

Water supplies are of especial importance to man. The construction of wells, cisterns, etc., will be briefly considered and the application of sanitary measures to prevent and control their pollution will be discussed. The proper treatment and disposal of private and municipal sewage presents a problem of no small importance. Work has been planned in this course to present some of the problems pertaining to the sanitary production and distribution of foods.

This course is designed to acquaint the student with the nature and importance of micro-organisms and thus better explain biological changes in nature and susceptibility to disease. (Animal Husbandry, Poultry and Dairy Manufactures majors.)

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR PERRIELLO AND MR. LARKIN.

BACTERIOLOGY S-4. (Dairy Bacteriology) II.

Bacteria and other micro-organisms are the responsible agents for changes which occur in milk, and for the contagion which sometimes causes disease. They are found in milk at times when leaving the udder. They get in with the dust and dirt while milking and they adhere to the dairy utensils which carry them over from one milking to the next. From cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster on the other.

Many of these changes occurring in milk are undesirable, such as ropy milk, sour milk, bitter milk, tainted milk, etc. Many of these changes are encouraged as the ripening of cream for butter, of milk for cheese, of milk for milk drinks. The former are fought, the latter fostered.

Micro-organisms of typhoid fever, scarlet fever, diphtheria and other diseases find their way by means of milk to the consumer and produce epidemic forms of these diseases.

Various bacteriological tests for the estimation of the numbers and types of organisms in milk are studied. Special attention is given to the interpretation of results indicated by the standard plate, Breed, methylene blue, and Burri methods of testing milk quality. Laboratory procedures for the determination of special groups of bacteria not normally found in milk, such as fecal contaminants and heat resistant organisms, are discussed. The proper use of these methods will quickly enable one to locate the source of trouble and check any further continuance.

It is evident, therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of this course, which is required of all students who elect dairying as one of their special lines of work.

1 class hour and 2 4-hour laboratory periods a week.

Credit, 5.

ASSISTANT PROFESSOR PERRIELLO AND MR. LARKIN.

BEEKEEPING S-1. (Fall Management, Wintering, Honey, and Bee Diseases) I.

The students are given an opportunity for individual handling of bees in the early fall, and field studies are made of the bee colony and its organization. Studies and practice in fall feeding are followed by a similar treatment of winter protection and the bees are then prepared for winter. During the latter part of the semester the surplus honey is extracted and prepared for market, a laboratory study made of the product and, finally, the commoner bee diseases are discussed and methods of control pointed out.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR SHAW.

BEEKEEPING S-2. (Spring Management, Pollination, and Honey Production) II.

The first part of the semester is occupied in assembling and studying the equipment used in beekeeping, but as soon as the weather permits, work is resumed on the bees in the apiary. Studies are made in spring management; pollination in the apple orchards is particularly stressed, and attention is then turned to the preparation of the colonies for honey production.

Throughout the entire course, wherever possible, the work is made practical and individual, enough theory being given so that the student will understand the reasons for his manipulations.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR SHAW.

BOTANY S-1. (Tree Physiology) I.

A study of the living tree is provided in this course. Functions of tree roots, leaves and trunk in obtaining and using water, air and nutrient materials are considered. Included among the vital activities of trees are: (a) chemical changes in building up, transfer, and breaking down of tree substances; (b) changes involved in growth, development, and reproduction; (c) changes in response to external stimuli.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR KOZLOWSKI.

BOTANY S-2. (Diseases of Trees and Shrubs) II.

This course is planned for students in Horticulture. It deals with the nature and causes of disease in plants; types of disease affecting trees, shrubs, and herbaceous plants; methods of combating plant diseases.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

MR. DUNTON.

BUSINESS ENGLISH S-1 and S-2. I. II.

This course is designed to cover review work in the fundamentals of grammar and composition, and to give students training and practice in writing various types of business letters and reports.

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR DUBOIS, MRS. WRIGHT.

BUSINESS MANAGEMENT S-1. I.

This course is designed primarily for students majoring in Floriculture. It involves a study of records and accounts used by florists; costs and prices; uses of capital and credit; house and store management; advertising; buying and selling; economic use of labor and equipment; general business trends as affecting the flower business; how the florist should make adjustments to meet economic changes; analyses of going concerns; and finally a bringing together of all information studied and applying it to the successful organization of a business. The entire course is to be made as applicable and practical as possible.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR LINDSEY.

BUSINESS MANAGEMENT S-3. I.

This course is designed primarily for students majoring in Dairy Industry. The principles of business organization and management are considered in relation to the successful operation of a dairy plant. The course includes a study of the following: various records and accounts used by dairies; costs and prices; uses of capital and credit; economic trends as affecting the business; how to make adjustments in the business to meet economic changes; analyses of different types of going concerns; and finally a bringing together of all the information studied and applying it to the successful organization of a business.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR LINDSEY.

ENTOMOLOGY S-2. (Insect Pests of Ornamental Trees, Shrubs, and Flowers) II.

A course designed to acquaint the student with the major pests of the plants mentioned. Class will be divided: Arboriculture and Ornamental Horticulture students in Section I; Floriculture students in Section II.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR SHAW.

ENTOMOLOGY S-6. (Turf Insects) II.

A course designed to acquaint the student with the principal pests of turf. General introduction to Entomology, followed by study of specific pests of turf.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR HANSON.

FARM MANAGEMENT S-1 and S-2. (Farm Management and Accounts) I. II.

The work in this course involves a study of farm records and accounts; costs and prices of farm products; uses of capital and credit; types of farming, selection of crop and live stock enterprises; size, diversity and production as related to the successful farm business; farm layout and arrangement; economic use of labor, power and equipment; detailed analysis of both successful and unsuccessful farms, how the farmer should make adjustments to meet economic changes; and finally, a bringing together of the information gained and applying it to the successful organization of a farm business.

Actual farm records are used to illustrate the above points. The entire course is made as applicable and practical as possible.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR BARRETT.

Note.—Farm Management will be given both semesters. The first semester will be for students majoring in Animal Husbandry; the second semester for students majoring in Poultry Raising, Fruit Growing and Vegetable Growing.

FARM MANAGEMENT S-3. (Efficiency in Farming Operations) I.

For Freshmen. This is an introductory course to the regular Farm Management work which comes in the second year. It is in no sense a theoretical consideration but rather a study of the practical aspects of the efficiency of the many day-to-day jobs found on various types of farms. In brief, a careful analysis is made of the "one best way" of doing the jobs. The course involves a study of farm layout, building layout, economical use of machinery and equipment, and efficiency in hand operations. The primary objective is to point out ways of reducing farm labor costs. Motion pictures will be used to illustrate good methods versus poor or inefficient methods.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR BARRETT.

FOOD TECHNOLOGY S-2. (Basic Principles, Freezing, Canning and Pickling) II.

Principles of food preservation including refrigeration and modern locker storage management are covered. Work is given in the use of packaging materials and the examination and grading of food products. Three field trips will be required. Estimated cost \$10.00.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

MR. ZALKAN.

FOOD TECHNOLOGY S-4. (Special Products) II.

The class and laboratory exercises in this course are planned to meet the needs of students majoring in Dairy Industry. General principles of food preservation and their application to the subject of dairying are discussed in class exercises. Crushed fruits, fruit juices, syrups, flavored syrups and other products which are utilized in the dairy trade are manufactured and tested.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR LEVINE.

FORESTRY S-3. (Woodland Management) I.

The first part of this course is devoted to the study and practice of the principles of timber volume estimating and forest mapping. The field work for both parts includes practical problems in forest management.

1 class hour and 1 4-hour laboratory a week.

Credit, 3.

HYGIENE S-1. I. (For Freshmen)

Lectures on personal hygiene, including the physiological basis for sound health habits, the importance of the systematic planning of a student's daily program in order to provide the proper amounts of time for study, with suitable periods of sleep, relaxation, recreation, and sports; posture, appropriate types of exercises, proper nutrition, social adjustment, the necessity for frequent medical, optical, and dental advice; sanitation and group health requirements.

1 class hour a week.

Credit, 1.

THE DEPARTMENT.

PRACTICAL SCIENCE S-7 and S-8. I. II.

This is a course in applied sciences, chiefly in the fields of chemistry and physics, as they are tools serving the needs of the food and dairy industries. In general, the course is designed to give an introduction to scientific thought and phenomena by means of lectures, textbook study and classroom demonstrations. The emphasis is entirely built around the practical problems in the student's field of work.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR EVERSON.

PUBLIC SPEAKING S-1 and S-2. I. II.

The aim of the course is to give the student confidence in himself while speaking before groups, and to have him acquire some knowledge of, and practice in, the more practical types of public speaking.

1 class hour a week.

Credit, 1.

ASSISTANT PROFESSOR NIEDECK, MR. ZAITZ.

VETERINARY SCIENCE S-1. (Animal Sanitary Science) I.

Sections for Animal Husbandry, Dairy Industry, and Poultry Husbandry Major students. Conservation of the health of animals is the keystone of successful animal husbandry. This course acquaints students with the essentials upon which the health of animals depends. In order that students may later guard the animals in their charge, attention is given to conditions favoring communicable and non-communicable diseases, and to prophylactic measures.

3 class hours a week.

Credit, 3.

PROFESSOR LENTZ AND ASSOCIATE PROFESSOR SMITH.

VETERINARY SCIENCE S-2. (Applied Animal Sanitary Science) II.

A continuation of S-1. The Animal Husbandry section will study the more common diseases of cattle, horses, sheep, and swine, and the Poultry Husbandry section will study poultry diseases. Causes; development; emergency; control; eradication; and prophylactic measures will be emphasized.

3 class hours a week.

Credit, 3.

PROFESSOR LENTZ AND ASSOCIATE PROFESSOR SMITH.

PHYSICAL EDUCATION FOR WOMEN

PROFESSOR TOTMAN

This program aims at an all-round development of the student. It gives the student activity adapted to her needs; assists in overcoming remediable physical defects and bad health habits; it encourages good health standards, helps her build up skill in sports and games and swimming and leaves her with possibilities for spending leisure time wisely.

REQUIRED COURSES

PHYSICAL EDUCATION S-1. I.

Outdoor season—field hockey, archery, tennis, swimming, volleyball. Indoor season—badminton, special gymnastics, games, swimming, dancing.

3 class hours a week.

Credit, 2.

THE DEPARTMENT.

PHYSICAL EDUCATION S-2. II.

Indoor season—badminton, special gymnastics, swimming, volleyball, bowling, dancing. Outdoor season—archery, swimming, softball.

3 class hours a week.

Credit, 2.

THE DEPARTMENT.

ELECTIVE COURSES

PHYSICAL EDUCATION S-3 and S-4. I. II. (For Seniors)

The senior program is arranged to give the student an opportunity to express her desire for wholesome physical recreation, to further develop desirable character traits and social qualities and qualities of leadership.

3 class hours a week.

Credit, 2.

THE DEPARTMENT.

PHYSICAL EDUCATION FOR MEN

MR. KOSAKOWSKI, ASSISTANT PROFESSOR DERBY

REQUIRED COURSES**PHYSICAL EDUCATION S-1. I. (Recreation.—For Freshmen. Outdoor games.)**

The following outdoor games are taken up: Softball, touch football, and swimming. Men may elect football or cross-country. The course aims to give every man the opportunity to develop sufficient control over his body to enable him to get pleasure from physical activities and to establish correct health habits. Not required of veterans.

2 laboratory hours a week for first half semester.

Credit, 1.

THE DEPARTMENT.

PHYSICAL EDUCATION S-5. I. (Recreation.—For seniors. Outdoor games.)

Includes the games of volleyball, softball and swimming, with the object of giving the men exercise material for use in after school days. Men may elect football or cross-country. Not required of veterans.

2 laboratory hours a week for first half semester.

Credit, 1.

THE DEPARTMENT.

ELECTIVE COURSES**PHYSICAL EDUCATION S-4. II. (Recreation.—For freshmen and seniors.)**

(Basketball and Indoor Track.) January-March.

Students electing this course must be regular members of the basketball, or indoor track squads and report regularly for practice with those squads.

Credit, 1.

THE DEPARTMENT.

PHYSICAL EDUCATION S-6. II. (Recreation.—For seniors.)

The senior class is divided into three or four major groups according to the number of students electing the spring physical education program. An intramural softball league schedule is played and an indoor and outdoor track meet run off. The group winning the highest average in all three events will have its name engraved on the Stockbridge School spring athletic trophy.

Credit, 1.

THE DEPARTMENT.

SHORT COURSES AT THE UNIVERSITY OF MASSACHUSETTS

Short courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore there is no age limit. Enrolled in short courses are the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty-five years Short Courses have served thousands of students in this Commonwealth, and the demand for these courses since the war has increased greatly due to both veteran and non-veteran demand.

DIRECTORY OF INFORMATION

A. The University

Those desiring University catalogs and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, and those with questions regarding admission to the university, either to the freshman class or to advanced standing should address William L. Machmer, Dean of the University, Amherst, Mass.

B. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Fred J. Sievers, Director of the Graduate School, Amherst, Mass.

C. Short Courses

For information concerning the Short Course Units, the Stockbridge School of Agriculture, write or apply to Roland H. Verbeck, Director of Short Courses, Amherst, Mass.

D. Correspondence Courses

Correspondence courses are offered in Commercial Vegetable Growing; Farm Management; Home Flower Gardening; Poultry Husbandry. For detailed information write to Professor Alden P. Tuttle, French Hall, University of Massachusetts, Amherst, Mass.

APPLICATION FOR ENROLMENT IN THE STOCKBRIDGE SCHOOL OF AGRICULTURE

Name.....Date.....
City or Town.....Street.....State.....

Present Occupation.....Age.....
School or College Attended:.....

Name of School.....Number of Years in High School.....

Place.....Are you a Veteran?.....

Indicate by a check mark the course in which you desire to register. Do not check more than one.

- | | |
|---|---|
| 1. Animal Husbandry (Dairy Farming) | 7. Food Management (For Hotel and Restaurant Trade) |
| 2. Dairy Industry (Dairy Plant Operation) | 8. Forestry |
| 3. Poultry Husbandry | 9. Fruit Growing |
| 4. Arboriculture | 10. Ornamental Horticulture (Landscape Gardening) |
| 5. Commercial Vegetable Growing | 11. Turf Maintenance |
| 6. Floriculture | |

References.—I am personally acquainted with the above applicant, and know.....
to be of good moral character, industrious, studious, and physically capable. Not required of veterans.

1. Name.....Position.....

Address.....

2. Name.....Position.....

Address.....

(Two references are required, and should not be members of your own family. Your minister and your teacher, or a former employer, are desirable. These persons should sign the application themselves.)

Mail this blank to **ROLAND H. VERBECK, Director of Short Courses**

UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS.

Important.—Be sure to file citizenship certificate if State tuition rate is claimed. Not required of veterans.

FORM II

CERTIFICATE OF CITIZENSHIP

The University of Massachusetts charges a tuition fee of \$200 a semester to students who are not residents of Massachusetts. In order to satisfy the university authorities that an applicant is entitled to state tuition of \$50 a semester, they require a statement signed by the clerk of the city or town in which the applicant resides, certifying to the fact that the parent or guardian of the applicant is a legal resident of said city or town. Where the guardian is certifying to this statement, it will be necessary for him to furnish copies of his appointment by the court. Such a statement may be made on the form below. If this is not presented when the student registers, the Treasurer has no option but to collect tuition on the above basis. When requesting the City Clerk to sign this certificate, an applicant for admission to the university should give the name and address of the parent or legal guardian unless he himself is of legal age.

This is to certify that I am the father.....mother.....legal guardian.....

of.....
Student's Name

Signed.....

This is to certify that on the date specified below (Insert name of parent or guardian)

.....is a legal resident of.....
Parent's Name

....., Massachusetts.
Town or City

Signed.....
Town or City Clerk

Date.....
Seal

Mail this blank to **ROLAND H. VERBECK, Director of Short Courses**

UNIVERSITY OF MASSACHUSETTS AMHERST, MASS.

This certificate must be filed with application blank if lower tuition rate for citizens of Massachusetts is to be secured. Not required of veterans.

GRADUATES — 1949

*Anthony John Ackerman, Jr.	Ludlow, Massachusetts
*Henry Dewey Ainsworth, Jr.	Grafton, Massachusetts
Patricia Ruth Aldrich-Ames	Melrose, Massachusetts
Ellis Nye Allen	Medfield, Massachusetts
*Allen Fiego Ball	Waltham, Massachusetts
*Paul Eugene Bamforth	Wayland, Massachusetts
*Bruce Manter Barter	Berlin, Massachusetts
Phillip Warren Bartlett	Berlin, Massachusetts
*Donald Robert Batchelder	Weymouth, Massachusetts
Herbert Dutton Bates	Carlisle, Massachusetts
Joseph Edward Beatty, Jr.	Huntington, Massachusetts
*Harold Fostene Bigelow, Jr.	Northfield, Massachusetts
Harold McClellan Blackie, Jr.	Chelmsford, Massachusetts
*Franklin Hudson Blackman, Jr.	Worcester, Massachusetts
Harry Marion Boissoneault	Southbridge, Massachusetts
*William Arthur Bowers, Jr.	Lynn, Massachusetts
*William John Boyd	Whitinsville, Massachusetts
Ralph Carter Breed	Lancaster, Massachusetts
*Richard Thomas Broderick	Boston, Massachusetts
*Vernon Lincoln Brooks	North Middleboro, Massachusetts
*Stanley Joseph Buczynski	Sunderland, Massachusetts
Robert Stanley Burley	Fitchburg, Massachusetts
Stanley Belding Buss	Chicopee, Massachusetts
*George Alfred Cadario	Bedford, Massachusetts
Walter Douglas Campbell, Jr.	Middleboro, Massachusetts
*Clarence Daniel Cash	Greenfield, Massachusetts
Walter Freeborn Chace	Swansea, Massachusetts
*Frank Roderick Chadbourne	Braintree, Massachusetts
*James Frank Chretien	Roxbury, Massachusetts
Harold Elliott Coleman	Gloucester, Massachusetts
*Edward Francis Conley	Cambridge, Massachusetts
*Edward Howe Cotton	Florence, Massachusetts
*Albert Louis Cover	Boston, Massachusetts
Nelson Ernest Crafts	Northampton, Massachusetts
William Hume Crowell	East Dennis, Massachusetts
*Robert Russell Cunningham	Groton, Massachusetts
*James Arthur Darling	Fairhaven, Massachusetts
Gordon Hoyt Davidson	Worcester, Massachusetts
Henry Fulton Davis, III	Westwood, Massachusetts
Robert Martin Degen	Adams, Massachusetts
John Joseph Deslauriers	Ware, Massachusetts
*Joseph DiRico	Marlboro, Massachusetts
*Richard Bryant Dowley	Longmeadow, Massachusetts
Charles Edward Drake, Jr.	Amherst, Massachusetts
Everett Floyd Drumm	Great Barrington, Massachusetts
Joseph Lincoln Eggleston	Danvers, Massachusetts
*Donald Richardson Ellis	Winchester, Massachusetts
*James Pitts Emerson	Chelmsford, Massachusetts
Harrison Bartlett Fecteau	South Hadley, Massachusetts
Harry Arthur Flood, Jr.	Hudson, Massachusetts
*Edward Fontanella	Medway, Massachusetts
*Charles Peter Frankenberg	Concord, Massachusetts
John Henry Frazier	Winchendon, Massachusetts
Paul Joseph Frederick	Winthrop, Massachusetts
Charles Addison Frost	Concord, Massachusetts
*Alexander Galanis	Marlboro, Massachusetts
George Newell Galusha, Jr.	Granby, Massachusetts
James Carmen Geneva	West Boylston, Massachusetts
Charles Carmine Giacobbe	Revere, Massachusetts
*Aaron Irving Gotlib	New Bedford, Massachusetts
Fred Richard Grandy	Hudson, Massachusetts
*Francis Norcross Grinnell	North Dartmouth, Massachusetts
*Richard Squier Hannum	Ludlow, Massachusetts
*John Nicholas Harbilas	Holyoke, Massachusetts
Donald Morrison Hawes	Sudbury, Massachusetts
*Edwin Stevens Hayes	Westhampton, Massachusetts
Elmer Raymond Hill	Hubbardston, Massachusetts
*William Schofield Holmes	St. Bruno, Canada
Robert Albert Homans	Springfield, Massachusetts
Alice Louise Howarth	Upton, Massachusetts
*Hugh Franklin Hubbard, Jr.	Whitman, Massachusetts
*Merrill Kinsley Hussey	East Lynn, Massachusetts
*Herbert Colby Hutchings, Jr.	Amherst, Massachusetts
*Paul James Jennings	Brighton, Massachusetts
*Warren Wentworth Jermain	Clinton, Massachusetts
George Everett Jones, Jr.	Belmont, Massachusetts
*William Howard Kennedy	Amherst, Massachusetts
Andrew Gilmore Ketchen, Jr.	Wayland, Massachusetts
Roy Wallace Kimball, Jr.	Haverhill, Massachusetts
*Loren Marsh King, Jr.	Hudson, Massachusetts
Kenneth Bashford Kirk	East Walpole, Massachusetts
Jacob Kupelian	Northbridge, Massachusetts
*Norman Bliss Ladd	North Amherst, Massachusetts
*Lyndon Walter Lafey	Enosburg Falls, Vermont
*Allen Oliver Leskinen	Hubbardston, Massachusetts
Francis Brainard Lyman, Jr.	Amherst, Massachusetts
Thomas Peter Lyons	Woburn, Massachusetts

*Herbert Arthur Mague	Littleton, Massachusetts
*Christopher Makrides	Somerville, Massachusetts
*George Christ Margosis	Holyoke, Massachusetts
*Donald Oliver Martin	East Longmeadow, Massachusetts
*Frank Lawrence Merrill, Jr.	Somerset, Massachusetts
*Frank Redmond Miano	Holyoke, Massachusetts
Carolyn May Miller	Northfield, Massachusetts
*Fredric Lincoln Millett	Whitman, Massachusetts
Donald Lee Mitchell	Lynn, Massachusetts
*William Irving Moore	Easthampton, Massachusetts
*Raymond James Morocco	North Adams, Massachusetts
Edward Thurbur Morrison, Jr.	BillERICA, Massachusetts
*Graydon Franklin Moses	Attleboro, Massachusetts
Donald Calvin McCray	Monson, Massachusetts
*Donald MacKay, Jr.	East Hartford, Connecticut
*Harry Lorne MacKinnon, Jr.	Melrose, Massachusetts
*William Stewart Newhall	Newburyport, Massachusetts
Gilbert White Nichols	Grafton, Massachusetts
*Emil Oscar Nilsson	North Chelmsford, Massachusetts
*Alvin Earl Nix	Framingham, Massachusetts
*Lawrence Mansfield Nixon	Westford, Massachusetts
Justin Yvon Nuttelman	Florence, Massachusetts
Victor Oliveira	New Bedford, Massachusetts
*Kayem Ovia	Whitinsville, Massachusetts
*Geoffrey Edward Page	North Amherst, Massachusetts
*John Alfred Page	Amherst, Massachusetts
Ernest John Parsons, Jr.	Wollaston, Massachusetts
*Francis Alfred Patterson, Jr.	Arlington, Massachusetts
*Otis Henry Peluso	Lynn, Massachusetts
*Vincent Pietraszka, Jr.	Groveland, Massachusetts
Arthur Ernest Plourde	Chicopee Falls, Massachusetts
Arthur Palmer Prentiss, Jr.	Danvers, Massachusetts
*Victor Henry Randolph	West Stockbridge, Massachusetts
*Roy William Reinhold, Jr.	Pittsfield, Massachusetts
Leo Hubert Roberge, Jr.	Palmer, Massachusetts
Robert Gustave Roehrich	Bridgeport, Connecticut
*Robert John Rogers	Dedham, Massachusetts
*David Peerman Roney, Jr.	Somerville, Massachusetts
*Richard Sheldon Royle	West Springfield, Massachusetts
*Oscar Omer St. Thomas, Jr.	Worcester, Massachusetts
*Raymond Augustus Salvie	Seekonk, Massachusetts
Summer Clark Schwartz	Agawam, Massachusetts
Gordon Lionel Scotland, Jr.	Ashland, Massachusetts
*Peter Ovila Senecal, Jr.	Southville, Massachusetts
Richard Edward Shelnut	Northampton, Massachusetts
*Frank Lewis Shufelt	Walpole, Massachusetts
Daniel Richard Silvar	Marlboro, Massachusetts
*Charles George Simmons	Fairhaven, Massachusetts
*Bernard Joseph Simoneau	Auburn, Massachusetts
David Smarsh	Middleboro, Massachusetts
*Clarence Bailey Smith	New Braintree, Massachusetts
*Lindsey Edmund Smith, Jr.	West Brookfield, Massachusetts
*Remo Guido Sodano	Somerville, Massachusetts
Ralph Marshal Souza, Jr.	Fairhaven, Massachusetts
*Jason William Squires	Leyden, Massachusetts
*William Stasinios	Holyoke, Massachusetts
*Frank Stewart	North Andover, Massachusetts
*Arthur Farnham Stiles, Jr.	Reading, Massachusetts
*John Henry Stone	Orange, Massachusetts
*John Francis Sullivan	North Andover, Massachusetts
Paul Sullivan	Arlington, Massachusetts
William Nelson Swan	Worcester, Massachusetts
*John Henry Thibault	Lake Pleasant, Massachusetts
*Dwight Loomis Tiffany	Easthampton, Massachusetts
*Donald Warren Toelken	Longmeadow, Massachusetts
Ernest Cole Verrill	Concord, Massachusetts
*Edward Anthony Wasielewski	Webster, Massachusetts
*Joseph Vincent Waters	Peabody, Massachusetts
*Chester Peter Wedrychowski	West Springfield, Massachusetts
Gilbert Edward Wheeler	Wrentham, Massachusetts
*Donald Howe Whelpley	Weston, Massachusetts
*Frank Joseph Whisenant	State Line, Massachusetts
*Earl Richard Williams	Springfield, Massachusetts
*Joseph Henry Witaszek	West Warren, Massachusetts
George Edward Wood	Middleboro, Massachusetts
Willis Clinton Woodruff	Lunenburg, Massachusetts

AS OF THE CLASS OF 1948

*Howard Priest Carter	Gardner, Massachusetts
Edward Joseph Machno	Hadley, Massachusetts
*Wesley Holmes Osborne, Jr.	Norwell, Massachusetts
*George Hersey Wallace	Natick, Massachusetts

*Veterans—World War II

CLASS OF 1950

	<i>Home Address</i>	<i>Amherst Address</i>
Alger, Loring Sanford	Brockton	32 Kendrick Place
Allen, John Thacher	Worcester	35 High Street
Allen, Norris Eugene	Attleboro	67 McClellan Street
Anderson, Richard Lee	Framingham	88 Eames Avenue
Anderson, Robert Gordon	Northampton	Northampton
Ashe, William Patrick	Springfield	303 North Pleasant Street
Baker, Harold Rene	Holyoke	Holyoke
Bangs, Frederick Andrew	Lee	Rocky Hill Road
Barnett, Robert Lorner	Hudson	14 Allen Street
Barron, Elmer Walter, Jr.	Malden	12 Colony Court
Barry, John Gallen	South Hadley	South Hadley
Bateman, Richard Clarke	Lexington	647 Main Street
Beach, Norman Raymond	Florence	335 Amity Street
Bennett, Kendall Knapp	Melrose	Rocky Hill Road
Berberian, Kachadore	Northboro	508 Elm Street, Northampton
Bidwell, Joseph Daniel	Granby, Conn.	42 Cottage Street
Bond, Robert Douglas	Dover	62 Triangle Street
Bonitto, Louis Tuttle	Hingham	39 Paige Street
Borysewick, Wallace Joseph	Florence	269 North Pleasant Street
Braginton, Jackie Desmond	West Harwich	15 Hallock Street
Brown, Bruce Allen	Sterling	334 Lincoln Avenue
Bruneau, Andrea Marie	Tewksbury	Thatcher Hall — Room 405
Bryant, Roger Penniman	Needham	32 Kendrick Place
Burt, Jairus Salls	Easthampton	Easthampton
Camann, Herbert Alvin	Athol	15 McClellan Street
Cande, John Louis	Dalton	12 Colony Court
Cassidy, Richard Burton	Framingham	14 Allen Street
Chambers, John Herbert	New Bedford	269 North Pleasant Street
Chapin, Milton Wilbur	Athol	367 North Pleasant Street
Charles, Donald Walter	Bradford	12 Dickinson Street
Charles, Harry Everette, Jr.	Bradford	12 Dickinson Street
Chase, Donald Francis	Holyoke	Holyoke
Cobb, Preble	Cambridge	861 North Pleasant Street
Coggeshall, Roger Gibbs	Bournedale	153 Pine Street, Florence
Collis, Leonard Stuart	West Springfield	West Springfield
Conway, Ralph Elliott	Arlington	108 High Street
Copeland, John Richard	Pittsfield	South East Street, S. A.
Creighton, Everett Andrews	Milton	269 North Pleasant Street
Crittenden, Richard	Wakefield	334 Lincoln Avenue
Dale, Wilton Campbell	Worcester	32 Clark Street, Easthampton
Damour, Lawrence Richard	Whitinsville	45 Ellis Park-Trailer Camp
Davis, Barbara Anne	West Duxbury	Lewis Hall — Room 206
Dawson, William Samuel	Medford	108 High Street
Deame, Carl Peter, Jr.	Pittsfield	98 Spring Street
Deary, Joseph Henry	Webster	Commonwealth Circle P-8
Dewey, Robert Greer	Longmeadow	East Leverett
DeWolf, Donald Jesse	Newton	26 Spalding Street
Doherty, George Francis	Fall River	Commonwealth Circle P-9
Dolloff, Wallace White	Norwell	South East Street, S. A.
Donahue, Aloysius John	North Grafton	800 North Pleasant Street
Doody, Henry Leonard	Winchendon	10 Tyler Place
Downing, James Joseph	Dedham	8 Sunset Avenue
Duarte, Joseph, Jr.	West Barnstable	41 Cottage Street
Dziza, Eugene Frank	Chicopee Falls	449 North Pleasant Street
Fahey, Robert Joseph	Milford	North Whitney Street, Ext.
Fay, Donald Maynard	Wollaston	472 North Pleasant Street
Feddema, Leonard William	Whitinsville	Ellis Park-Trailer Camp
Fellows, George Marshall, Jr.	Worcester	Main Street, Sunderland
Ferestien, Robert Julian	Foxboro	15 Fearing Street
Fernandez, Manuel	Southampton	902 North Pleasant Street
Fitzgibbons, Raymond James	Holyoke	Holyoke
Frost, Maurice Howard, Jr.	Saugus	12 Colony Court
Frost, Walter Edwin	West Boxford	24 Dickinson Street
Fuller, James Mark	Still River	32 Ellis Park-Trailer Camp
Fuller, Robert Cunningham	Still River	12 Colony Court
Fuller, Russell Friedrich	Springfield	156 Montague Road
Ganley, Norman Edward	Beverly	367 North Pleasant Street
Gast, Edwin George	Ashland	14 Allen Street
Gelatt, Mark Frank	Leicester	Commonwealth Circle P-8
Gelinas, Allen Burns	Edgarton	North Whitney Street, Ext.
Giardina, Anthony Albert	South Boston	24 Dickinson Street
Gibavic, George John	Worcester	Westview Park-Trailer Camp
Gold, Howard Gilbert	East Longmeadow	Poultry Plant
Gorman, John Paul	Woburn	800 North Pleasant Street
Gorski, Edward John	Chicopee Falls	449 North Pleasant Street
Graham, Daniel Joseph	Arlington	367 North Pleasant Street
Grant, Robert Edward	Northampton	Northampton
Grimard, Ernest Harvey	Springfield	Springfield
Guild, Robert Haynes	Berlin	461 North Pleasant Street
Haeseler, Carl William	Northampton	Northampton
Hanagan, John Joseph	Framingham	334 Lincoln Avenue
Handrahan, John George	Cochituate	35 McClure Street
Hanks, Harold Standish, Jr.	Wellesley	14 Allen Street
Hansen, Milton Emil	Granville	472 North Pleasant Street
Harvey, Glenn Weaver	Sharon	R. F. D. #2

	Home Address	Amherst Address
Haverty, Leo Joseph	Leominster	Commonwealth Circle P-8
Henrickson, Robert William	Worcester	382 North Pleasant Street
Heyliger, Frederick Theodore	Acton	269 North Pleasant Street
Hill, Peter Sherwin	Brookline	Amherst Road, Leverett
Hollis, Stanley Joseph	Cambridge	Main Street, Sunderland
Homich, John Joseph	Pittsfield	12 Colony Court
Hooker, Dean Chapman	Holbrook	334 Lincoln Avenue
Houston, John	East Longmeadow	14 Cosby Avenue
Howe, Glover Elbridge	West Hartford, Conn.	98 Lincoln Avenue
Hunter, Robert Raymond	Lincoln	14 Cosby Avenue
Huntley, Robert Ernest, Jr.	Hanover	800 North Pleasant Street
Jackson, Robert Wesley	Attleboro	97 Gray Street
Jacobs, Perry Warburton	Worcester	45 Dana Street
Jacques, Allen Lawrence	North Adams	375 North Pleasant Street
Johnson, Alden Lee	Attleboro	Commonwealth Circle P-7
Johnson, Harry Carl	Rutland	303 North Pleasant Street
Johnson, Ralph Norman	Milton	334 Lincoln Avenue
Johnson, Stewart Sanfred	Townsend	Pomeroy Manor—Belchertown Road
Johnson, Stuart LeRoy	Sterling	334 Lincoln Avenue
Johnson, Thomas Matthew	Taunton	25 North Pleasant Street
Jolin, Francis Leo	Medford	South East Street
Jordan, Raymond Douglas	Springfield	334 Lincoln Avenue
Joseph, Richard Carver	Norwell	334 Lincoln Avenue
Judge, Frank William	Holyoke	30 Chestnut Street
Kearney, Charles Augustus, Jr.	Auburndale	South East Street
Keith, Harold Morris	Worcester	Elm Tree Inn
Kenney, Paul Leonard	Lunenburg	Pomeroy Manor—Belchertown Road
Kenyon, Norman Curtis	Great Barrington	32 Kendrick Place
Kimball, Gladys Mae	Haverhill	Lewis Hall-Room 206
Kulesa, John Frank	Whately	Whately
LaBonte, Richard Francis	Springfield	335 Amity Street
Lagerstrom, George Walter	Needham	45 Ellis Park-Trailer Camp
Lambert, Donald Raymond	Monson	Main Street, Sunderland
Langevin, Herman Eugene	Southbridge	Experiment Station House
Lapine, Eugene Albert	North Adams	34 Kellogg Avenue
LaRoche, Germain Ernest	Dracut	902 North Pleasant Street
Lauder, Robert Francis	Amherst	34 High Street
LaValle, Francis James, Jr.	Amherst	Stanley Street
Lawler, George Sherriffs, III.	Marblehead	Commonwealth Circle P-12
Libbey, Leonard Morton	Boston	303 North Pleasant Street
Libby, John Earle	Cummaquid	12 Colony Court
Lilly, David	Dorchester	303 North Pleasant Street
Linnehan, John Eugene	Haverhill	Commonwealth Circle P-5
Livingston, Philip Hollyday	Needham Heights	19 McClellan Street
Long, Donald Herbert	Monument Beach	Commonwealth Circle P-10
Longden, Robert Gage	New Bedford	269 North Pleasant Street
Loomis, Robert Walter	Shelburne Falls	34 Spring Street
Lowd, Frederick Emrich	South Easton	25 North Pleasant Street
Mackiewicz, Frank	Abington	375 North Pleasant Street
Mahoney, Richard Holt	Brookline	375 North Pleasant Street
Makliney, Paul	South Hadley	South Hadley
Mascaro, Joseph James	East Longmeadow	303 North Pleasant Street
Maynard, Paul Edward	Belmont	25 Nutting Avenue
Mayo, John Mathew	Framingham	30 Harris Street, N. A.
Mello, David Paul	Marlboro	24 Dickinson Street
Mitchell, Fred Francis, Jr.	Newton Center	30 Harris Street, N. A.
Moodie, John Lindsay	Sturbridge	25 Pine Street, N. A.
Moore, Stanley Clarke	Quincy	108 High Street
Morgan, Arthur Walter	Wakefield	25 Nutting Avenue
Morgan, Edward Kendall	Millbury	Commonwealth Circle P-10
Moynihan, Walter Dennis	Springfield	382 North Pleasant Street
Mundell, Graydon William	Holyoke	41 Cottage Street
McCarthy, Jeremiah Alphonus	Roxbury	367 North Pleasant Street
McCollester, Kenneth Edwin	Shirley	Commonwealth Circle P-6
McKinstry, Warren Chapin	Chicopee Falls	358 North Pleasant Street
Nash, Philip Clinton	Westboro	12 Dickinson Street
Nilges, Frederick William	Maynard	South East Street
O'Connor, Gerald James	Holyoke	Holyoke
O'Halloran, Charles Robert	Watertown	21 Sunrise Avenue
Olson, Raymond Karl	Northampton	Northampton
Onishuk, Martin Warrell	Dedham	334 Lincoln Avenue
Osgood, Robert George	Danvers	11 Dickinson Street
Page, Ernest Henry	Springfield	Commonwealth Circle P-11
Parmelee, Charles Rollin	Holden	303 North Pleasant Street
Peatfield, Howard Murray	Mattapan	R. F. D. #2
Perry, Rollin Wendall	Revere	R. F. D. #2
Peterson, Kenneth Raymond	Worcester	Elm Tree Inn
Phelon, John Wells	Granville	472 North Pleasant Street
Poirier, George Alphonse	Taunton	25 North Pleasant Street
Priest, George Edward	Winchendon	10 Tyler Place
Proctor, Harold Libby	North Weymouth	382 North Pleasant Street
Prova, Ferdinando	Springfield	24 Dickinson Street
Rafferty, Robert Gordon	Chelmsford	24 Dickinson Street
Rahm, Harry Alfred	Great Barrington	Commonwealth Circle P-7
Rattigan, William Gerald	Brighton	Memorial Hall

	Home Address	Amherst Address
Recos, Gabriel Francis	Petersham	Petersham
Reed, William Chalmer	Melrose	25 Nutting Avenue
Reynolds, John	Swansea	449 North Pleasant Street
Richardson, Harold Alan	Woburn	382 North Pleasant Street
Robinson, George Edward	Framingham	South East Street
Robinson, Richard Post	Needham	269 North Pleasant Street
Rogers, Charles Louis	Holyoke	91 Gray Street
Rogers, Florian Edward	Belchertown	Belchertown
Rossner, Albert George, Jr.	Westminster	334 Lincoln Avenue
Ruminas, William, Jr.	Foxboro	12 Colony Court
Rush, James Henry	Lexington	62 Triangle Street
St. Amand, James Cleophile	Indian Orchard	Indian Orchard
Sawicki, Charles Kazmierz	New Bedford	13 Hadley Court
Sheehan, Ruth Elizabeth	Holyoke	Holyoke
Simeone, Salvatore Anthony	Natick	367 North Pleasant Street
Simmons, Roy George	Becket	8 Clifton Avenue
Siok, Theodore Peter	Ludlow	375 North Pleasant Street
Small, Melvin David	Belchertown	Belchertown
Smith, Carlton Nelson	East Bridgewater	41 Cottage Street
Smith, Clayton Dana	New Bedford	39 Northampton Road
Smith, David Gardner	South Westport	58 Pine Street, N. A.
Smith, Frederick Murray	Ashburnham	Amherst Road, Leverett
Smith, George Franklin	New Bedford	R. F. D., Belchertown
Smith, Raymond Griddle	Lynn	24 Dickinson Street
Smith, Robert Leland	South Westport	97 Gray Street
Soper, Ronald Traine	North Weymouth	Experiment Station House
Spear, Richard Weston	Norwood	Amherst Road, Leverett
Stauffer, William Earl	Staughton	32 Kendrick Place
Stelle, Robert Westbrook	Holyoke	Holyoke
Stockbridge, John Carleton	Westfield	334 Lincoln Avenue
Stumpf, George Albert, Jr.	East Hartford, Conn.	25 Pine Street, N. A.
Swedberg, Ralph Richard	Worcester	Elm Tree Inn
Szereyko, Robert Adolph	Worcester	Commonwealth Circle P-9
Tanner, John Hauley	Springfield	Springfield
Tassinari, Vincent Joseph, Jr.	Haverhill	23 East Pleasant Street
Thayer, Paul Emmons, Jr.	Worcester	367 North Pleasant Street
Thomas, George Maynard	Boston	382 North Pleasant Street
Thomas, William Robert, Jr.	Stoneham	Commonwealth Circle P-6
Toomey, Lawrence Daniel	Arlington	269 North Pleasant Street
Valentine, Edward Leonard	East Chelmsford	375 North Pleasant Street
Vieira, Ernest Frank	New Bedford	77 North Prospect Street
Walsh, William Francis	Peabody	367 North Pleasant Street
Warnock, Raymond Donald	Easthampton	Easthampton
Washburn, John Andrews	New Bedford	469 North Pleasant Street
Watson, Russell William	Worcester	Elm Tree Inn
Watson, William Arthur	Belmont	109 Main Street
Weldin, Paul, Jr.	Delaware	Commonwealth Circle T-3
Wells, Harry Wardman	Longmeadow	14 Westview Park—Trailer Camp
Wendolowski, Bernard Stanley	Hatfield	Hatfield
Wenk, Charles Joseph, Jr.	Springfield	Commonwealth Circle P-11
West, David Earl	Amherst	South East Street
Westcott, Ellis Royden, Jr.	Seekonk	Commonwealth Circle P-5
Westcott, Samuel Richardson, Jr.	North Adams	Commonwealth Circle P-7
Whalen, Donald Francis	Worcester	335 Amity Street
White, Donald Walter	New Bedford	334 Lincoln Avenue
White, Walter Donald	New Bedford	334 Lincoln Avenue
Whiton, George Edward	Hingham	367 North Pleasant Street
Wickes, Ira Francis, Jr.	Pittsfield	97 Gray Street
Williams, Duncan James	Worcester	Commonwealth Circle P-6
Williams, Gordon Oliver	Sunderland	Sunderland
Wilson, George Prescott	Arlington	97 Gray Street
Wood, Albert Chapman	Leominster	12 Colony Court
Worsman, Wilfred Playdon	Franklin	34 Kellogg Avenue
Wrabel, Michael George	Webster	30 Chestnut Street
Yokes, Robert Lee	Medford	Mount Pleasant Inn

Special Student

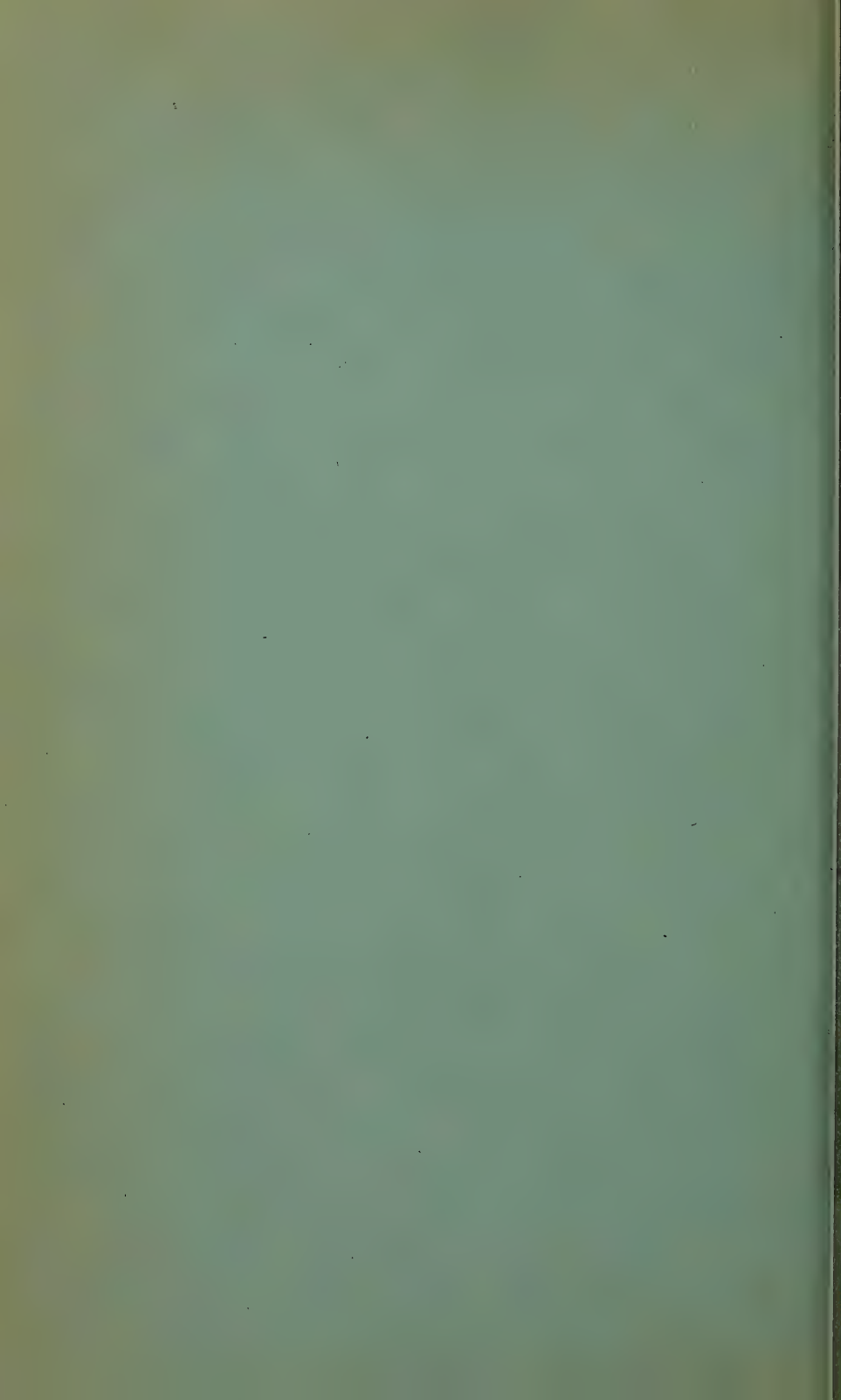
Burnett, Marston	Great Barrington	59 Dryads Green, Northampton
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"God grants liberty to those who love it, who are always ready to guard and defend it."

"The cultivation of the earth is the most important labor of man. Unstable is the future of the country which has lost its taste for agriculture. If there is one lesson of history that is unmistakable, it is that national strength lies very near the soil."

—DANIEL WEBSTER.

Born in Salisbury, New Hampshire, 1782-1852. His father a farmer of Scottish stock. Graduated from Dartmouth College in 1801. In 1820 he aided greatly in revising the constitution of Massachusetts. Became one of the greatest orators in the nation. Lived and died in Marshfield, Massachusetts.



Bulletin

**UNIVERSITY OF
MASSACHUSETTS**

COMMENCEMENT

1949



ALUMNI REUNION PROGRAM

SATURDAY, JUNE 4

- 10:00 A. M. Annual Meeting of the Associate Alumni, Auditorium, Memorial Hall.
- 12:00 M. 1st Annual Alumni Clambake, Drill Hall.
Alternative luncheon, Draper Hall
- 2:15 P. M. Speaking Program, Drill Hall
- 2:30 P. M. Alumni Parade, Memorial Hall to Alumni Field.
- 3:00 P. M. Varsity Baseball Game—with Springfield College, Alumni Field. Following the game there will be a half-hour concert on the college chime.
- 4:00 P. M. Alumnae Tea, Edna Skinner Hall
(home economics building)
- 6:00 P. M. Class and fraternity reunions and suppers as arranged by the various organizations.
- 9:00 P. M. Roister Doister Play — "I Remember Mama", Bowker Auditorium.

CLASS REUNIONS

ALUMNI REGISTRATION HEADQUARTERS, MEMORIAL HALL

- 1887 62nd Reunion—Evan F. Richardson, Millis.
- 1888 61st Reunion—Herbert C. Bliss, 807 Broad St., Providence, R. I.
- 1889 60th Reunion—Franklin W. Davis, 42 Kenneth St., West Roxbury
- 1894 Annual Reunion—Dr. S. Francis Howard, 58 Main St., Northfield Vt.
- 1899 50th Reunion—George C. Hubbard, Sunderland.
- 1904 45th Reunion—Sumner R. Parker, Extension Service, South College.
- 1909 40th Reunion—Samuel S. Crossman, 32 High St., Greenfield.
- 1914 35th Reunion—Edward L. Hazen, 768 North Pleasant St., Amherst
- 1919 25th and 30th Reunions combined. Mary E. Garvey, Marshall Hall Annex — and committee.
- 1924 25th Reunion—Allen Leland, 17 Stilson Ave., Florence — and committee.
- 1929 20th Reunion—John R. Kay, 50 Grand St., Reading — and committee.
- 1934 15th Reunion—William Esselen, Food Technology Laboratory
Donald Durell, Wilder Hall
- 1939 10th Reunion—Howard N. Steff, R. F. D. 3, Amherst.
- 1944 5th Reunion—Charles W. Dunham, French Hall.
- 1946 3rd Reunion—Roger G. Richards, Amherst Rd., South Hadley
- 1948 1st Reunion—Warren Gingras, 21 Marshall St., Turners Falls.

University of Massachusetts

Bulletin

Amherst, Mass.



SKINNER HALL

FARM and HOME DAY

UNIVERSITY OF MASSACHUSETTS

Thursday, July 21, 1949

General Information

Information Desk

An information desk will be located in Stockbridge Hall, where telephone messages and mail for visitors will be received from 9:00 a.m. to 8:00 p.m. Telephone number is Amherst 900.

Rooms

Room arrangements can be made at Information Desk after 1:00 p.m. on Wednesday, July 20. The price will be \$1.50 per night. Linen will be furnished. Bring your own soap and towels. Reservations should be made in advance by writing to the Poultry Department, U. of M., Amherst.

Rooms are available in private homes where one may be assured of comfortable quarters and courteous treatment. The average price is \$2 per night.

Hotel rooms in Amherst average \$3 to \$4.50 per person.

Meals

The University cafeteria will serve meals (G. I. style) during Farm and Home Day as follows:

Morning	- - - - -	7:15 to 8:30
Noon	- - - - -	11:30 to 12:45
Evening	- - - - -	5:30 to 6:30

The University Store, North College, will be open from 8:30 a.m. to 5:00 p.m.

Children's Nursery

Children's Nursery will be maintained at the Nursery School, Skinner Hall (new home economics building) from 9:30 a.m. to 5:00 p.m. This will be available for pre-school children, age 2 to 5. There will be no charge.

COUNTRY DANCE FESTIVAL

Alumni Field

8:00 P. M.

Featuring an Unusual Array of
Outstanding Dance Teams and Callers

ADMISSION 50 CENTS, Including Federal Tax

VOL. XLI

JULY, 1949

NUMBER 7

PUBLISHED SEVEN TIMES A YEAR BY THE UNIVERSITY OF MASSACHUSETTS
JANUARY, FEBRUARY, MARCH, APRIL, MAY, JUNE, JULY
ENTERED AT THE POST OFFICE, AMHERST, MASS. AS SECOND CLASS MATTER

Forestry

1:00 p.m. Field trip to University Forest on Mount Tobey. Staff of Forestry Department in charge. Meet in automobiles at French Hall.

Trip will show various forest operations carried out in the last 3-4 years. Includes thinning, weeding, pruning, other cultivation. Of special interest will be a new one-cord charcoal kiln and demonstration of preservation of fence posts and farm timbers against decay and termites.

Note:—In case of rain, group will meet in French Hall where illustrated talks on Mount Tobey forest activities will be given.

General Session—Bowker Auditorium

4:00 "The Individual in International Affairs"
Raymond Dennett, Director, World Peace Foundation, Boston

Beekeeping

FRENCH HALL, ROOM 209

Leonard Rice, Greenfield, President of Massachusetts Federation Beekeepers' Association, Presiding

9:45 a.m. Registration and Introductory Remarks

10:00 "Colony Management"
E. J. Anderson, Associate Professor Agriculture, Pennsylvania State College

11:00 "What Is New in Queen Breeding?"
W. J. Nolan, Agriculturist, National Research Center, Beltsville, Md.

12:15 p.m. Lunch

1:15 Business Meeting—Federation of Beekeepers' Association

2:00 "Some Recent Developments in Beekeeping"
W. J. Nolan

3:00 "Handling the Honey Crop"
E. J. Anderson

General Session—Bowker Auditorium

4:00 "The Individual in International Affairs"
Raymond Dennett, Director, World Peace Foundation, Boston

Please Bring This Program With You July 21

Home Garden

MEMORIAL HALL

Lyle L. Blundell, Department of Landscape Architecture,
U. of M., Presiding

9:30 a.m. "The Plant World in Our Homes and Gardens"
Clark L. Thayer, Department of Floriculture,
U. of M.

10:30 "Landscape Design for the Small Home-Grounds"
Mrs. Ruth Faulk White, Brockton

11:45 Lunch

S. Church Hubbard, Department of Floriculture,
U. of M., Presiding

2:00 p.m. Panel Demonstration of Flower Arrangement

Alfred W. Boicourt Department of Floriculture
Donald E. Ross University of Massachusetts

General Session—Bowker Auditorium

4:00 "The Individual in International Affairs"
Raymond Dennett, Director, World Peace Founda-
tion, Boston

Fruit

ORCHARDS NEAR COLD STORAGE

- 10:00 a.m. 1. Exhibits of Graders, Packages and Conveyor Equip-
ment
2. Small Group Tours of Experimental Orchards
The high points of these tours will include:
Chemical Thinning; Shot-gun Pollination; Mc-
Intosh Strain Tests; Foliage Application of
Nitrogen; New Spray Material Tests on Apples,
Pears and Peaches; and Chemical Mowing

12:00 Lunch

Goessmann Auditorium

Ben Drew, Westford, President of Massachusetts
Fruit Growers Association, Presiding

1:30 p.m. "Marketing Apples Through Quality Cider"
Mayo Derby, Derby Farm, Leominster, Mass.

2:00 "Handling McIntosh from Orchard to Consumer"
Dr. C. H. Merchant, University of Maine

Please Bring This Program With You July 21

3:00 "Contrast Between the 1947-48 Apple Deals in Massachusetts"
F. E. Cole, Extension Specialist in Fruit and Vegetable Marketing, U. of M.

3:30 "Report on the Size of the Apple Crop"
Walter E. Piper, Division of Markets, Massachusetts Department of Agriculture

General Session—Bowker Auditorium

4:00 "The Individual in International Affairs"
Raymond Dennett, Director, World Peace Foundation, Boston

Dairy

BOWKER AUDITORIUM

Victor A. Rice, Dean, School of Agriculture, U. of M., Presiding

10:30 a.m. "Thyroprotein Feeding for Dairy Cattle" or "Shall We Step up Production by Use of This Hormone?"
Dr. H. D. Eaton, Professor of Animal Husbandry, University of Connecticut
Discussion led by John Archibald, Research Professor, U. of M.

12:00 Presentation of National Dairy Products Corporation Awards to top D.H.I.A. Herds and D.H.I.A. Supervisors, by Ira M. Pelmore, Field Representative

12:30 p.m. **Lunch**

1:30 "Vibrio Fetus Infection in Dairy Cows"
Dr. Wayne Plastridge, Department of Animal Disease, University of Connecticut

2:15 Panel on Herd Health
Leader, S. N. Gaunt, Extension Dairyman, U. of M.
Panel members: Prof. A. C. Ragsdale, chairman of Dairy Department, University of Missouri; Dr. Plastridge, R. O. Robie, Whitinsville; Dr. J. J. Malnati, North Adams; Dean V. A. Rice; Prof. Eaton; F. Kuhns, Mill River; Prof. A. Cowan, and Dr. W. K. Harris, U. of M.

General Session—Bowker Auditorium

4:00 "The Individual in International Affairs"
Raymond Dennett, Director, World Peace Foundation, Boston

Please Bring This Program With You July 21

Homemaking

SKINNER HALL AUDITORIUM

Beatrice E. Billings, State Home Demonstration Leader,
U. of M., Presiding

- 10:00 a.m. Singing
Doric Alviani, Assistant Professor of Music,
U. of M., Leader.
- 10:15 "Adventures in Arts and Crafts"
Frank A. Staples, Director, Arts & Crafts Service
of National Recreation Association, New York
City
- 11:00 "Challenge to the American Home Today"
Mrs. James W. Sever (Mrs. T. Grafton Abbott),
Cambridge, formerly Consultant in Parent Educa-
tion, Division of Child Hygiene, Massachusetts
Department of Public Health
- 12:15 Lunch

MEMORIAL HALL

- 2:00 See Home Garden Program
- General Session—Bowker Auditorium
- 4:00 "The Individual in International Affairs"
Raymond Dennett, Director of World Peace
Foundation, Boston

STATE HOME DEMONSTRATION COUNCIL MEETING

Dinner at Wiggins Tavern, Northampton
5 - 8 p. m. Tickets at Dinner

Mrs. Alton Boan, Westport, President

Goat

STOCKBRIDGE HALL, Room 102

John Kay, Whitman, Massachusetts Council of Milk Goat
Breeders' Association, Presiding

- 10:30 a.m. "Development of Goat Industry in Massachusetts"
Ellsworth W. Bell, Extension Economist, U. of M.
- 11:00 "Goats in the Livestock Picture"
Byron E. Colby, Extension Animal Husbandry
Specialist, U. of M.

Please Bring This Program With You July 21

- 12:00 **Lunch**
- 1:00 p.m. **Meet One Another**
- 1:30 "Goats at the University of Missouri"
 Prof. A. C. Ragsdale, Chairman of Dairy Department, University of Missouri
- 2:00 "Feeding the Dairy Goat"
 Paul Newman, Beacon Milling Co., Cayuga, N.Y.
- 2:40 "Composition and Properties of Goat Milk"
 Dr. Arthur D. Holmes, Professor of Chemistry, U. of M.
- 3:20 "Problems of Practical Goat Keeping"
 Mearle Rhinesmith, Wanaque, N. J.

General Session—Bowker Auditorium

- 4:00 "The Individual in International Affairs"
 Raymond Dennett, Director, World Peace Foundation, Boston.

Departments Open for Inspection

1. **French Hall Green House**—open 8:00 a.m. to 5:00 p.m.
2. **Labeled Weed Exhibit**—located between vegetable green houses — on display all day.
3. **Flint Laboratory**—open 9:30 to 11:30 a.m. and 2:00 to 4:00 p.m. Equipment used in the commercial dairy plant for the manufacture of pasteurized milk, ice cream, butter, and cheese can be seen. Also testing equipment for the analysis of milk.
4. **College Barns**—open during daylight hours. Seven breeds of cattle, two of sheep, two of horses, and one of swine are kept.
5. **Goodell Library**—open 8:30 a.m. to 5:00 p.m. For browsing and reading. Daily newspapers and over 300 magazines are available. Building houses over 100,000 books.
6. **Skinner Hall**—(new home economics building). Open 8:30 a.m. to 5:00 p.m. Special exhibits of interest to all persons.
7. **Poultry Farm**—rear of Stockbridge Hall. Many young pullets will be in the laying houses. Five breeds are being maintained at the present time. This farm is used primarily for teaching purposes. Facilities include killing, egg, incubator rooms.
8. **Publications**—entry E, South College—open 9:00 a.m. to 11:30 a.m. and 1:00 p.m. to 4:30 p.m. The Extension Service has over 700 different publications for distribution on agriculture and home economics subjects. Inquire for list.

Please Bring This Program With You July 21

TURN POSTAGE GUARANTEED

AMHERST, AS SECOND CLASS MATTER

The University of Massachusetts

REPORT OF THE PRESIDENT

to the Board of Trustees, the Governor,
and the Citizens of the Commonwealth

JANUARY, 1949 TO JANUARY, 1950



*Building a Well-Balanced
University of Massachusetts*

January 19, 1950

The Honorable Joseph W. Bartlett
Chairman, Board of Trustees
The University of Massachusetts

Sir:

I have the honor to present through you to the Board of Trustees for transmission to the Governor of the Commonwealth the annual report of the University of Massachusetts for the year ending January 1, 1950.

Respectfully submitted,

RALPH A. VAN METER, *President*

VOLUME XLII

JANUARY 1950

NUMBER 1

Published seven times a year by the University of Massachusetts; January, February, March, April, May, June, July. Entered at Post Office, Amherst, Mass., as second-class matter.

The report of the President for the year ending January 1, 1950, is part of the 87th annual report of the University of Massachusetts, and as such is Part I of Public Document 31. (Section 8, Chapter 75, of the General Laws of Massachusetts.)

*Building a Well-Balanced University
of Massachusetts*

REPORT OF THE PRESIDENT

During the past year the University of Massachusetts has continued its advance toward our goal of a university that is great in the quality of its work, and that will carry its share of responsibility for the educational and research needs of the Commonwealth.

The most significant development of the year was the admission of 621 freshman students, combined with the transfer of the last of our students from the Fort Devens branch to the permanent campus at Amherst. The freshman class was a third larger than that of a year ago, and a half larger than previous postwar classes on this campus. Only 37 of the 621 freshmen were veterans; hence, this class marks the opening of long-awaited opportunities to the younger students who have found it difficult to enter a university crowded with veterans.

The closing in June of the University at Fort Devens brought to an end that successful venture in emergency higher education for veterans, and indicated, again, that most of the veterans who plan to go to college have entered and have passed beyond their sophomore year.

No new buildings were authorized in the past year, but we have occupied the new Hasbrouck Laboratory for Physics and the Gunness Laboratory for Mechanical Engineering. The Alumni Building Corporation has completed four more dormitories. These have made a notable contribution to living space on the campus and to classroom and laboratory facilities.

Before the war our facilities were extended to the full by 1670 students, of whom 1261 were in the undergraduate college. To expand the physical plant, it was necessary to build a new power plant with new and larger steam lines and new and larger electrical conduits. This required a considerable outlay of funds that has not resulted directly in more room for students. This service construction will soon be completed, and

we shall be able to grow normally for a long time without having to go back to the very grass roots to start.

The largest enrollment in the history of the University has crowded every corner of the campus with 3920 students in the first semester. This is the high point of the veterans program at the University. It is a source of satisfaction to all of us that we can report to you and, through you, to the people of the Commonwealth that problems in connection with the higher education of veterans which seemed insurmountable in 1946 have been resolved to the extent that the end of the project is in sight and no qualified veteran in Massachusetts has been turned away.

This was made possible through your own effective efforts in developing sound policies and in bringing crucial problems to the attention of those who could do something about them; through the cooperation of the Legislature and State administrators who have had a real interest in the program, the Alumni and their self-liquidating dormitory project, and the Federal Government which helped with buildings and finances; through the cooperation of interested groups of citizens who have given strong expression of their concern at crucial times; and, finally, through the efforts of a devoted University teaching and maintenance staff to whom the accomplishment of what seemed impossible has become almost routine. As we remember these critical years — challenging and exciting, and, at the worst, never monotonous — the staff can look forward with confidence rooted in experience to the new and different problems that lie ahead.

Our experience with the veterans program has been repeated in almost every college in the land. The resulting rapid growth under terrific pressure has brought an upheaval that has shaken the colleges to their very foundations. Traditions have been smashed, and the resulting experiments, adjustments, and innovations will leave permanent effects on higher education in this country. Physical plants are greatly expanded, but the desire for more and more education has spread to such an extent that it is already clear that the facilities available will not long be sufficient to meet the demand. Universities with student populations far greater than anything ever known before raise problems that bear directly on the kind of higher education we shall have in the future in America. The financing of higher education becomes an acute problem when past war and the present armed truce absorb 75 per cent of the national budget.

As one result of the veterans program we have all been impressed once more with the fact that keen minds are not confined to families of wealth and position, and the problem of removing economic barriers to higher education has come to new prominence. Access to educational facilities will become more and more democratic as we work our way through the problems of the years ahead.

PROGRAM FOR IMMEDIATE FUTURE

Rapid growth after the war threw a heavy strain on the entire University organization. The faculty and administration concentrated on the things that were necessary for minimum facilities to carry the veterans program. Inevitably the organization grew without balance among all of the parts. Our next task will be to bring lagging elements up to the effective level already reached by most of our facilities. We have a many-sided program, and it may be summed up by listing some of the specific aims we are trying to realize in the immediate future:

We are trying to bring our enrollment among the four undergraduate classes into balance, and to round out our organization while we are at about the present enrollment level.

We are trying to achieve a better balance between teaching and research or other creative scholarship.

We are trying to effect an administrative organization adapted to the increased problems and responsibilities brought by a permanent doubling of the enrollment.

We are trying to complete facilities for Engineering and to bring our Public Health program into coordination with the State and the national programs in this area.

We are trying to develop dining and recreational facilities reasonably commensurate with the size of the student population, and to bring our maintenance organization into balance with the size of our physical plant.

We are trying to replace the temporary Federal housing, which is going to pieces, with permanent construction built on the self-liquidating plan.

All these things affect our efficiency as an educational institution. We are spread perilously thin in places, and the condition should be repaired. The forced growth of the veterans program is past. We need to round out our facilities at the level already

reached by almost all of them. Future growth will be normal and coordinated closely with the needs of the people and with the financial resources of the Commonwealth.

BALANCE IN ENROLLMENT

The sizes of the four classes at the University are out of balance and that will affect the total enrollment in the next two or three years. The branch at Fort Devens carried some 2600 veterans through the first two years, when they were transferred, most of them to Amherst. These transfer groups came into the junior class and built up that class and the senior class to numbers far above the 400 which we were able to admit each year at Amherst.

The senior class contains 1130 men and women, of whom nearly 80 per cent are veterans. This large class carries the peak load of veterans. The junior class has 750 members and the sophomore class 650. We were able to increase the freshman class this year from 400 to 600 as the first step toward bringing the classes back into balance.

Next year we shall be able to accept 800 freshmen to balance the enrollment further, and the full effect of increased facilities will become available to non-veteran applicants for admission. We hope this will make possible the acceptance of most of the well-qualified applicants, and will remove much of the pressure on the admissions office which has been so heavy for the last 15 years—especially since the end of the war.

A large class will be graduated in June and, with somewhat smaller classes following, this will result in a slight and temporary reduction in total undergraduate enrollment, despite the large freshman class. As entering classes of 800 move up through the four years the total enrollment will quickly return to about the present level. We will replace the veterans with well-qualified non-veterans as rapidly as we can admit them. Growth in enrollment above present numbers will depend upon an increase in the necessary facilities.

TEACHING AND RESEARCH

I am proud of the way our faculty has carried the veterans enrollment—the academic battle of the bulge I mentioned in my last report. Next September, when our undergraduate class enrollments come into reasonable balance once again, it is impor-

tant that a better balance be achieved between teaching and research or creative scholarship.

One great task of the University is to add to the fund of human knowledge. Also, most teachers must maintain an active interest in research or writing or some other form of creative scholarship if they are to be fully effective over a long period. Right now our teaching schedules are too crowded to permit a satisfactory amount of activity in this direction. Creative scholarship has a direct bearing on the quality of teaching and the quality of learning by students and the atmosphere of scholarship which must enfold a truly effective University. We hope that very soon we can remove the pressure from interested teachers to a degree which will make possible a marked development of creative scholarship by some of our very able staff members.

A related problem is the further development of our Graduate School. Again the present pressure of teaching schedules stands in the way, and we cannot increase the enrollment, but the demand for graduate instruction is greater than ever before. This is due partly to the "veteran bulge" which is moving into the graduate schools, but also to the great increase in knowledge which has made graduate work necessary to effective preparation for most professions.

We hope that soon we can develop our Graduate School further and extend it to more departments. Few things are so stimulating to a department in a practical way as an active program of research and graduate education.

COLLEGE OF ARTS AND SCIENCES

The heart of a university organization is a College of Arts and Sciences. We have a School of Liberal Arts and a School of Sciences which have been long established and are well developed. Each is headed by a teacher who is carrying a full teaching load. The combined enrollment is about 1500—larger than that of many liberal arts colleges. Both Schools have completely outgrown their administrative organizations. A year ago you directed us to bring the two Schools together into a College of Arts and Sciences around which the professional Schools would be organized. We have been unable to get authorization for a Dean. This is a key position in the University, and we cannot adjust our organization until we get it. In the meantime the situation is awkward, inefficient and uncomfortable for a lot of people.

This College would consist of the following departments now in the School of Liberal Arts: Education, English, Fine Arts, German, Romance Languages, Economics, History, Sociology, Philosophy, Psychology, as well as the sub-departments of Government, Speech and Journalism. The College would also consist of the following departments now in the School of Science: Bacteriology and Public Health, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, and Zoology. To merge these Schools without having anyone to handle the administrative work would lead to a chaotic situation. The one position of Dean of this College would greatly strengthen our entire University program.

It is to Arts and Sciences that we send our students for two years of general education in the humanities and fundamental sciences before they proceed to more specialized work in arts and sciences, or in the professional schools. This broad foundation is highly important in the development of effective men and women. A man who has little understanding outside the narrow range of his professional field may become a menace through his activities as a citizen. Their very professional competence will soon move many students of today into positions of great influence and power. It is of importance to all of us that they then throw their weight in the right direction. As Nicholas Murray Butler once phrased it, "We do not want narrow men. We want broad men, sharpened to a point." That is why the College of Arts and Sciences is so important in the University program, and why we hope we shall not have to wait much longer to bring the Schools of Arts and Sciences together into a more effective unit. It would give fresh impetus to a sound educational development.

The School of Engineering has a staff of 60 and is one of the largest Schools of the University but the administrative work is done, again, by a teacher. He has directed the building of an organized curriculum, recruited staff members, developed plans for new buildings, located the equipment, planned its arrangement in the buildings and directed the teaching programs of all Engineering departments. The School is seeking accreditation by professional engineering organizations and needs a full-time Dean to take over the administrative burden.

Another administrative position needed to bring our organization into balance is a divisional headship for our new School of Business Administration. The executive work of this School, too,

is done by a teacher who carries a full teaching load while serving as Head of the Economics Department—one of the largest in the University. He cannot continue much longer to carry this emergency work load and the excessive overtime required.

The School of Business Administration has an excellent staff and well developed curricula in Finance, General Business, Accounting, Industrial Administration and Marketing. Two books have recently been published by members of the School staff. An administrative position here would strengthen this important School and make possible a quality of supervision of budget and curriculum that is now impossible.

BUILDING NEEDS

In my annual report last year I discussed the building needs of the University to bring its facilities into balance—the dining hall, the completion of the main engineering building, the public health center, and the library.

Our dining problem is acute, and I am convinced, after long study, that it cannot be solved without an additional dining hall. Under high pressure we are feeding (and feeding is the right word) about 1400 of our 3920 students. Several hundred eat regularly at fraternity and sorority houses. Married veterans living on the campus eat at home, but they will soon be replaced by unmarried students. Hundreds must find other facilities—and other facilities are wholly inadequate.

The problem is not merely one of finding enough to eat to stay alive. Boys and girls of college age should have regular, well-balanced meals, prepared under the direction of a competent dietitian and served in such a way as to encourage a civilized and intelligent approach to dining. These students are forming life-long habits. Of immediate concern—under present conditions, they can and do impair their effectiveness as students. Many cannot be made to realize that living on sandwiches or desserts eaten hastily at all hours is a poor preparation for work of any kind. Because the need for another dining hall is so pressing, we have placed it at the head of the list of building needs.

Our Engineering program has proceeded satisfactorily to this point. Our Civil Engineering program, a part of which has been in effect for many years, was accredited during the past year. It is not so dependent on technical, machine-equipped labora-

tories as are other branches of Engineering. Our Mechanical Engineering Laboratory, occupied this year, offers splendid facilities in that field. This program undoubtedly will be fully accredited when it is completely in effect. The Electrical Engineering wing now under construction will open the way for a complete and satisfactory program in that important branch. .

The wing under construction is the first half of the Main Engineering Building. This building should be completed to round out our program in Engineering. This will be one of our largest and most important Schools, and we should have a full accredited program with facilities for graduating highly competent men. The completion of this building is the final step in setting up the classrooms and laboratories for a good program in Engineering.

In Chapter 599 of the Acts of 1947, the Legislature directed the University to build a Public Health Center on the campus. The Federal government has appropriated 42 per cent of the cost, and we are recommending that our Legislature provide the remainder of the funds this year to erect this building. It would provide headquarters for the Western Massachusetts Division of the State Department of Public Health, for the proposed Hampshire County Health Unit, for a New England Regional Training Center, and for our own Department of Bacteriology and Public Health. This coordination of educational and field programs in public health work is highly desirable because of its opportunities for joint use of equipment and close contact of personnel.

We have been cooperating for some years with the Massachusetts Department of Public Health, and 12 of its men are now at the University. They are fine cooperators, and strengthen our educational program. I trust that association with our staff has been equally helpful to them. The full cooperation of local, state, and regional officials should result in a health center that will benefit not only western and central Massachusetts, but the entire region.

Our library was built by State and Federal funds in 1935, when we had an undergraduate enrollment of 1069. That a library is fundamental to a University and that its development must not lag behind a general development program are points so obvious that I will not elaborate upon them. We have a fine library building and approximately 175,000 books. In the past few years of rapid growth we have not been keeping up with

new books, and have been forced to delay our library expansion for more urgent facilities. We must bring our library facilities into balance with the rest of the University.

Likewise, we must bring our maintenance organization into balance with the recent development of our physical plant. The size of our maintenance crew is hopelessly inadequate to keep the buildings clean and in reasonable repair. Since 1946 we have doubled the number of students, and we have increased the building floor space by 50 per cent while increasing the maintenance crew by 12 per cent. This is false economy. Every building is used constantly, and the wear is heavy. We must not let this fine plant deteriorate.

COLLEGE OF AGRICULTURE

A unique function of the University of Massachusetts in the Commonwealth, and one that it shares with land-grant universities in other states, is service to agriculture in teaching, research, and extension. Although Massachusetts is an industrial state, agriculture is a \$200,000,000 industry. The value of the agricultural output is greater in Massachusetts than in any other New England state.

We cannot achieve a safe degree of stability in our national economy until we find a way to give more stability to agriculture. That is one of our great economic problems. We need more leaders in agriculture who are outstandingly able—men who understand thoroughly the economic principles involved and their implications, and who have the traits of character and personality which make for leadership. Education can supply much of what is needed. We must never relax in our efforts to keep agricultural education abreast of developments in the field.

We have separate Schools of Agriculture and Horticulture in the undergraduate college, and a two-year technical and vocational program in the Stockbridge School, established in 1918. At present we have about 900 students in these Schools. Within the near future we should bring all our well-developed resources in agriculture and horticulture to a focus in one excellent professional school.

COST OF EDUCATION

We have a well-balanced undergraduate college today in terms of student majors or the scope of its educational programs,

and the cost of rounding out this organization after the uneven growth of the past few years will not be large. In the past year Massachusetts spent 54 cents per capita for its University. Rhode Island spent \$1.35 per person, while Connecticut spent \$1.85; New Hampshire, \$1.87; Vermont, \$1.59; and Maine, 84 cents. And yet, Massachusetts stands seventh in the nation and second in New England in per capita income of its people.

Our Commonwealth provides university facilities for a much smaller fraction of its population than any other New England state—having one student at the University for each 1209 residents. Rhode Island has one student for each 296 of its residents; Connecticut, one for each 216; New Hampshire, one for each 155; Vermont, one for each 113, and Maine one student for each 205 residents of the state. If New Hampshire, which stands approximately twenty-second in the 48 states in per capita income can spend \$1.87 per person for its State University, or more than three times the per capita cost in Massachusetts, certainly our Commonwealth, which stands seventh in per capita income, can provide somewhat more than 54 cents per person to educate the young men and women who will be the producers of wealth in our state in the years to come.

Although in the past three years we have doubled the opportunity of qualified Massachusetts youth to get an education at the State University, 800 is not a large entering class. There are 467 public and private high schools in our Commonwealth. This year approximately 50,000 boys and girls will be graduated, and the number of high school graduates will increase each year to reach approximately 75,000 by the end of this decade.

NEW SCHOOLS AND BRANCHES

Each year there are submitted to the Legislature bills for the establishment at the University of Schools of Medicine, Dentistry, Pharmacy and Law. Such Schools are expensive to establish and maintain. They cannot be founded by easy stages or approached half heartedly. Before positive steps are taken in this direction there should be careful surveys both of the need for additional services and of the possibility of the continued maintenance of schools that would be a credit to the Commonwealth.

In the present situation it would seem that more students would be served better by developing further some of the depart-

ments already established soundly with years of successful operation to their credit. The cost would be relatively low for developing such Schools as Education, Fine Arts, Public Health, and Physical Education, and each would render outstanding public service.

It has also been proposed that the Commonwealth establish a branch of the University in Boston. This would involve extensive duplication of facilities, and would make necessary the maintenance of two state universities. We try to give all students a maximum of general education while equipping them for specialized professions such as engineering, business and accounting, public health, teaching, journalism, landscape architecture, farming, food technology or such fields of science as physics, biology, chemistry, entomology and geology. To duplicate these services would be very expensive.

The University of Massachusetts is located near the geographical center of the Commonwealth. Most of the students can go home from Amherst in less than three hours. Since the students at few colleges have this advantage, distance from home can hardly be considered a serious handicap for students at the University.

The University brings together on one campus students with widely divergent interests and from very different backgrounds. Close association in classrooms and in student organizations brings the stimulus of contact with students representing sections other than the home town.

The State University is located almost ideally in a beautiful countryside removed from the distractions of a city. Most students will do better work under such circumstances than in the bustle and clamor of an urban environment, while the development of an active social and recreational life has every encouragement.

A system of scholarships to be awarded on the basis of need would seem to be the most logical way to meet the requirements of those students who cannot now afford to come to the University. Such scholarships would be far less expensive than the maintenance of branch universities and also more likely to be effective over the years in presenting excellent opportunities to those who need them.

EDUCATION AND SIZE

Of even greater importance than the rapid increase in size since the war years is the quality of the teaching and research done here, although this is obscure and hard to define and likely to be overlooked by those who are dazzled by rapid growth and sheer size. There are also those who question the possibility of real education where large numbers of students are involved, and who regret deeply the passing of the days when every student knew every other student in the college.

Effective teaching calls for the full and close cooperation of student and teacher to make every hour in classroom or laboratory a pointed educational experience. The great task of the teacher is to stimulate curiosity and interest and the desire to know, and to smooth the way to real understanding with well organized material and clear explanation. The student, too, has a real responsibility. He must take an active interest in learning and an aggressive attitude toward his work. This calls for close contact between teacher and student, but if this contact can be established and maintained the number of student-teacher units on one campus should offer no insuperable bars to effective educational procedures.

True, the time has come when a student cannot know well all or even most of the members of his own class; but on the other hand, he can know intimately as many as any student knew in the old days and he has a chance to choose his friends from a far larger group representing a much wider range of interests. He will be thrown into daily contact with them in classes and on the campus, and there are many advantages in the situation. We are confronted in this country with the problem of extending higher education to large numbers of students. I believe we shall find ways to do this very effectively.

Contact with other students is an important part of a college education. If scholarship is to be translated into effective living and worth while accomplishment, the student must learn to understand and to work with people. The individual who can see no viewpoint but his own is likely to meet solid obstruction everywhere. Formal educational activities cannot occupy all the time of a student, for a human being cannot long stand that kind of schedule. The University campus with some 85 student organizations offers something of interest to everyone, and it is an ideal

laboratory in which to learn to work with people toward common objectives.

The student will never again know so many people so intimately from close day to day contacts. Here he can learn to give way on minor matters or demand a little more until a stand is reached that is acceptable to the majority without compromising anything fundamental. Here he can learn that character and ability are the important attributes of men, and that they are not decided by race, creed or color. Here he can learn to exercise ever keener discrimination in selecting leaders of character and ability, and here he can get a fine start on many things that make for good citizenship. Extra-curricular activities are a very important part of the educational program, and their development on the campus has been favored by the larger student body.

We can see the possibilities ahead for a University that is outstanding in the quality of its work. Our heritage from the old days of soundly developed curricula in science and its application to agriculture, and of strong supporting courses in Arts and the Humanities, has given us a solid foundation that has the stability wrought by the thinking and the planning of generations of men and women.

Our task is to bring higher education, low in cost but excellent in quality, to the people of the Commonwealth. It is our part of the vigorous reaction of America to the most challenging educational problem of the Twentieth Century. This problem is not yet solved. Probably it will never be solved in full; but as we move forward, under your direction, to the new situations and the new problems of the second half of the century we are determined, with you, to do our best, always, with what we have.

RALPH A. VAN METER

President

January 19, 1950

UNIVERSITY OF MASSACHUSETTS ENROLLMENT

October 1949

UNDERGRADUATE COLLEGE AT AMHERST

Class.....	1950		1951		1952		1953		Total		
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
SCHOOL											
Liberal Arts	237	40	135	55	86	61	91	99	549	255	804
Science	185	33	133	26	107	36	113	59	538	154	692
Engineering	266	0	149	0	112	0	53	0	580	0	580
Agriculture	110	1	51	6	48	1	36	3	245	11	256
Business											
Administration	136	1	88	4	80	4	53	5	357	14	371
Agriculture	67	3	50	1	50	2	29	2	196	8	204
Home Economics	0	30	0	36	0	49	0	62	0	177	177
Division of Physical Education	22	0	17	0	7	0	16	0	62	0	62
Special									5	16	21
TOTALS	1023	108	623	128	490	153	391	230	2532	635	3167

GRADUATE SCHOOL

Men	Women	Total
260	45	305

STOCKBRIDGE SCHOOL

Class.....	1950		1951		Total
	Men	Women	Men	Women	
	191	3	248	6	448

SUMMARY (October 1949)

Undergraduate College	3167
Graduate School	305
Stockbridge School	448
Total Enrollment	3920

(Office of Publications, October 1949)

UNIVERSITY OF MASSACHUSETTS

Distribution of Undergraduate Students by Counties in Massachusetts as of October 1949:

Counties East of Worcester County

Essex	262
Middlesex	552
Suffolk	281
Norfolk	222
Bristol	136
Plymouth	99
Barnstable	46
Dukes	4
Nantucket	3

1605 or 50.68%

Worcester and Western Counties

Worcester	366
Franklin	142
Hampshire	331
Hampden	497
Berkshire	146

1482 or 46.79%

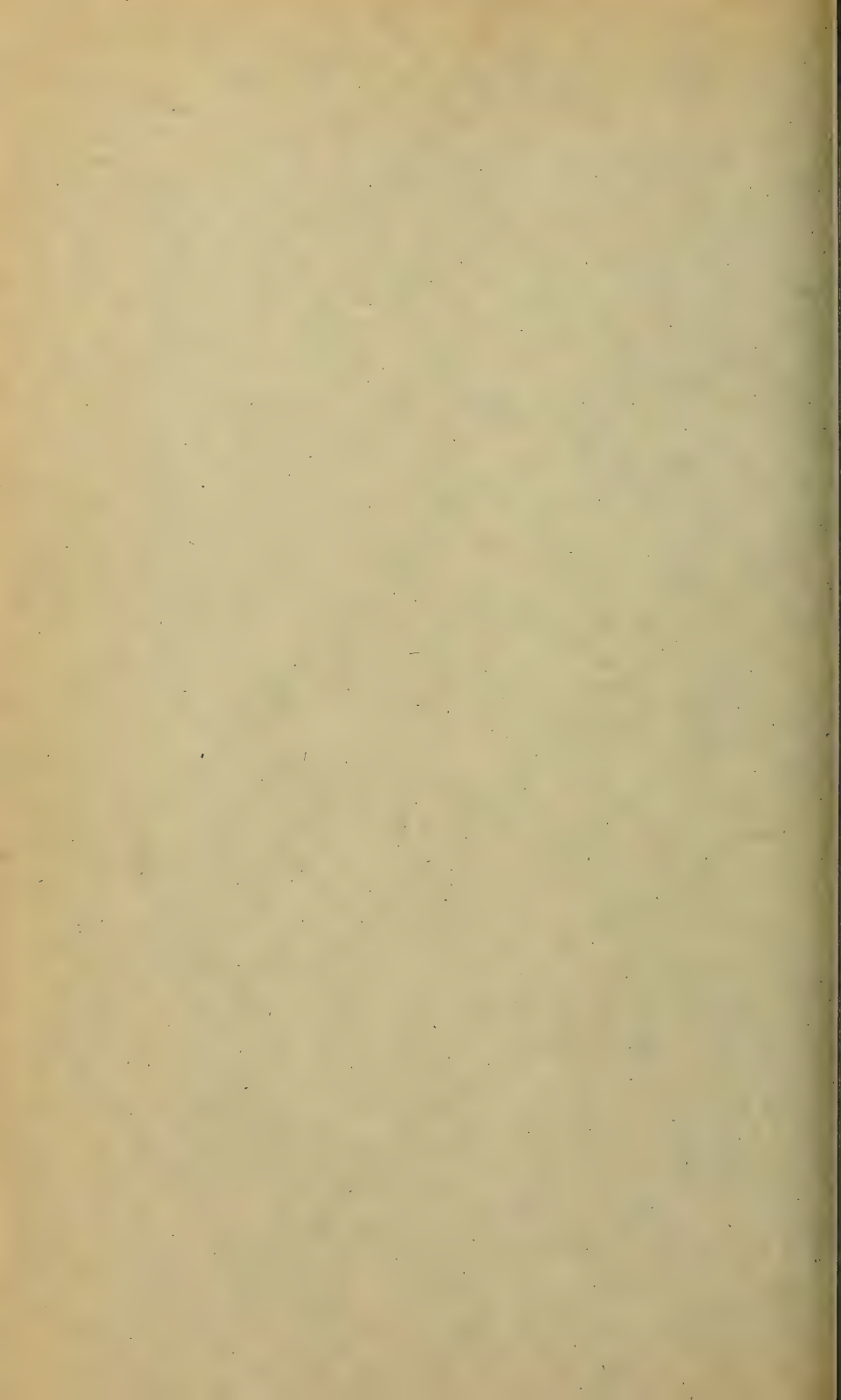
Unclassified

80 80 or 2.53%

3167 100.00%

Publication of this Document Approved by GEORGE J. CRONIN, *State Purchasing Agent.*

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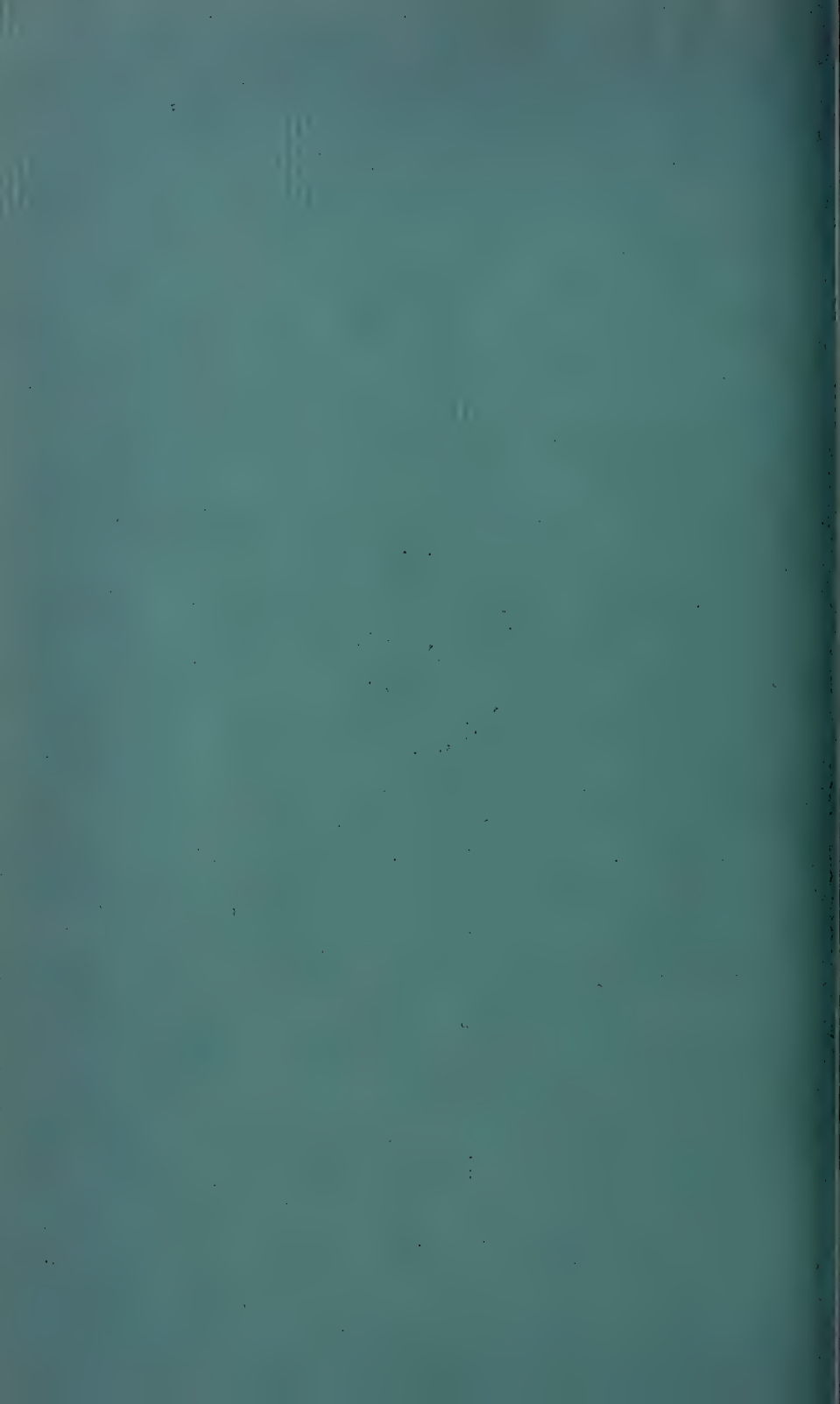
THE UNIVERSITY OF MASSACHUSETTS

BULLETIN



Annual Undergraduate Catalogue

**UNDERGRADUATE
SCHOOLS - 1950-51**





MEMORIAL HALL AND CAMPUS POND

The 700-acre campus is laid out in the form of an oval set off by the campus pond in the center. Memorial Hall was built by the Alumni as a memorial to the State University men who gave their lives in the first World War. The building is used as a student activities center, and for Alumni Association offices.



GOODELL LIBRARY



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Bulletin
UNIVERSITY
OF
MASSACHUSETTS

CATALOGUE OF THE UNIVERSITY

1950 - 1951



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FOREWORD

This Catalogue of the University presents announcements concerning courses, admission, etc., for the sessions of 1950-51.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

The University Catalogue for the sessions 1950-51 is part of the Eighty-Sixth Annual Report of the University of Massachusetts and as such is part II of Public Document 31. (Sec. 8, Chapter 75, of the General Laws of Massachusetts.)

ACADEMIC CALENDAR

1950

June 26, Monday. Registration for Summer Session.
June 27, Tuesday, 8:00 A.M. Summer Session opens.
July 4, Monday. Independence Day. No College Exercises.
August 5, Saturday, 12:00 M. End of Summer Session.
September 18, Monday, 9:00 A.M. Registration of Freshman and Senior Students.
September 19, Tuesday, 9:00 A.M. Registration of Sophomore and Junior Students.
September 20, Wednesday. Classes Begin for all but Freshmen.
September 21, Thursday, 8:00 A.M. Freshman Classes begin.
September 21, Thursday, 10:45 A.M. Opening Convocation.
October 12, Thursday. Columbus Day. No College Exercises.
November 11, Saturday. Armistice Day. No College Exercises.
November 22, Wednesday, 12:00 M. to November 27, Monday, 8:00 A.M. Thanksgiving Recess.
December 16, Saturday, 12:00 M. to January 3, 1951, Wednesday, 8:00 A.M. Christmas Recess.

1951

January 3, Wednesday, 8:00 A.M. Classes Resume.
January 18, Thursday, 5:00 P.M. Classes Stop.
January 19, Friday, 9:00 A.M. Registration of Freshman and Senior Students.
January 20, Saturday, 9:00 A.M. Registration of Sophomore and Junior Students.
January 22, Monday to January 31, Wednesday, 5:00 P.M. Final Examinations.
January 31, Wednesday, 5:00 P.M. First Semester ends.
February 5, Monday, 8:00 A.M. Second Semester begins.
February 22, Thursday. Washington's Birthday. No College Exercises.
March 31, Saturday, 12:00 M. to April 9, Monday, 8:00 A.M. Spring Recess.
April 19, Thursday. Patriot's Day. No College Exercises.
May 19, Saturday, 12:00 M. Classes stop.
May 21, Monday to May 29, Tuesday, 5:00 P.M. Final Examinations.
May 30, Wednesday. Memorial Day. No College Exercises.
June 1, Friday to June 4, Monday. Commencement.

BOARD OF TRUSTEES

Organization of October, 1949

ERNEST HOFTYZER, B.S. (Ohio State University), Wellesley	1950
ALDEN CHASE BRETT, B.S. (University of Massachusetts), Belmont	1950
MRS. ELIZABETH LAURA McNAMARA (Graduate Teacher's College), Cambridge	1951
LEONARD CARMICHAEL, S.B., SC.D. (Tufts College), PH.D. (Harvard University), LITT.D. (Portia), LL.D. (Boston University, Colgate University, Northeastern University, Rhode Island State College, St. Lawrence University), Medford	1951
MRS. JOSEPH SWAN LEACH, Walpole	1952
RALPH FRED TABER, B.S. (University of Massachusetts), A.M. (Harvard University), West Newton	1952
JOHN MARTIN DEELY, A.B. (Williams College), Lee	1953
CLIFFORD CHESLEY HUBBARD, A.B., PH.D. (Brown University), A.M. (Harvard University), Mansfield	1953
HARRY DUNLAP BROWN, B.S. (University of Massachusetts), Billerica	1954
JOHN WILLIAM HAIGIS, M.A. (Amherst College), Greenfield	1954
JOSEPH WARREN BARTLETT, A.B. (Dartmouth College), LL.B. (Harvard University), LL.D. (University of Massachusetts), Boston	1955
PHILIP FERRY WHITMORE, B.S. (University of Massachusetts), Sunderland	1955
WILLIAM MICHAEL CASHIN, A.B. (Boston College), Milton	1956
WILLIAM AYLOTT ORTON, B.A., M.A. (Christ's College, Cambridge), M.SC., D.SC. (University of London), LL.D. (Boston College), Northampton	1956

MEMBERS EX OFFICIO

HIS Excellency PAUL ANDREW DEVER, LL.B. (Boston University), *Governor of the Commonwealth.*

RALPH ALBERT VAN METER, B.S. (Ohio State University), M.S. (University of Massachusetts), PH.D. (Cornell University), *President of the University.*

JOHN JOSEPH DESMOND, JR., A.B., A.M. (Harvard University), D.ED. (Suffolk University), *Commissioner of Education.*

JOHN CHANDLER, B.A. (Yale University), *Commissioner of Agriculture.*

OFFICERS OF THE BOARD

HIS Excellency PAUL ANDREW DEVER, LL.B. (Boston University), *Governor of the Commonwealth, President.*

JOSEPH WARREN BARTLETT, A.B. (Dartmouth College), LL.B. (Harvard University), LL.D. (University of Massachusetts), Boston, *Chairman.*

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Metals Laboratory (Formerly Nursery School)

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Draper Hall

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Chapel

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Marshall Hall Annex

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ARTHUR SIDNEY LEVINE, B.S., M.S., PH.D. (University of Massachusetts), Associate Professor of *Food Technology*.

Food Technology Laboratory

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Food Technology Laboratory

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 University), *Assistant Professor of Agricultural Engi-*
neering. Stockbridge Hall

*On leave of absence for Military Service

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PAUL DAVID RITGER, B.N.S. (College of the Holy Cross), M.A. (University of Pennsylvania), *Instructor in Mathematics*.

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- JOHN EDWIN ROBERTS, B.S., M.S. (University of New Hampshire), PH.D. (Cornell University), *Assistant Professor of Chemistry.*
Goessmann Laboratory
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Stockbridge Hall
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Physical Education Building
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Stockbridge Hall

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setts), *Instructor in Botany.* Clark Hall
- HERBERT NORMAN STAPLETON, B.S., M.S. (Kansas State Col-
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setts), M.A. (University of Iowa), *Instructor in German.*
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Engineering Laboratory
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- CHARLES HIRAM THAYER, *Assistant Professor of Agronomy.*
Stockbridge Hall
- CLARK LEONARD THAYER, B.S. (University of Massachusetts),
Professor of Floriculture and Head of Department, and
Acting Dean of School of Horticulture. French Hall
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Instructor in Home Economics. Edna Skinner Hall
- ROBERT MURRAY THOMAS, B.A. (University of Massachusetts),
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- FREDERICK ROGERS TIBBETTS, B.A. (University of Massachu-
setts), *Instructor in German.* Liberal Arts Annex
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REUBEN EDWIN TRIPPENSEE, B.S. (Michigan State College), M.S. PH.D. (University of Michigan), *Professor of Wildlife Management.*

French Hall

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Chapel

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Chapel

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North College

WILLIAM GOULD VINAL, B.S., M.A. (Harvard University), PH.D. (Brown University), *Professor of Nature Education.*

Fernald Hall

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Drill Hall

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Stockbridge Hall

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Drill Hall

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Hasbrouck Laboratory

WILLIAM HENRY WEAVER, B.S. IN I.E., M.S. IN I.E., I.E. (Pennsylvania State College), *Professor of Mechanical Engineering.*

Stockbridge Hall

† On leave of absence.

- SIDNEY FREDERICK WEXLER, B.S. (New York University), M.A. (University of Colorado), *Instructor in Romance Languages*. Liberal Arts Annex
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- NORMAN EDWARD WILSON, E.E. (Cornell University), M.S. (Illinois Institute of Technology), *Associate Professor of Electrical Engineering*. Stockbridge Hall
- ALFRED DENNIS WINER, B.S. (Northeastern University), M.S. (Purdue University), *Instructor in Chemistry*. Goessmann Laboratory
- CHESTER HENRY WOLOWICZ, B.S. IN M.E. (Northeastern University), M.S. IN M.E. (Harvard University), *Associate Professor of Mechanical Engineering*. Stockbridge Hall
- GILBERT LLEWELLYN WOODSIDE, B.A. (DePauw University), M.A., PH.D. (Harvard University), *Professor of Biology and Head of Department of Zoology*. Fernald Hall
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- JOHN KARL ZEENDER, B.A., M.A. (The Catholic University of America), *Instructor in History*. Chapel

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- MAURICE BLAUER, B.S., M.S. (University of Massachusetts), *Teaching Fellow in Food Technology*. Food Technology Laboratory

- DONALD BIGELOW BRADLEY, B.S. (Brigham Young University),
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UNIVERSITY OF MASSACHUSETTS

The University of Massachusetts is the State Institution of the Commonwealth founded under the provisions of the Morrill Land Grant Act of Congress of 1862. This Act provided in each state for "the endowment for and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Massachusetts accepted the provisions of the Morrill Act in 1863 by founding a new college at Amherst to be known as "Massachusetts Agricultural College" and Chapter 75 of the General Laws of the Commonwealth states that "the leading object of the College shall be to teach subjects relating to agriculture and the mechanic arts so as to promote liberal and practical education. Its curriculum may include other scientific and classical studies and shall include military tactics."

The Trustees of Massachusetts Agricultural College were incorporated in 1863 and officers were appointed in that year. It was not until October 2, 1867, however, that the College was formally opened to students. At that time there were four teachers on the faculty and four wooden buildings on the campus. The enrollment steadily increased during the first term, however, and by December 1867, forty-seven had been admitted. From this modest beginning the College has grown steadily both in number of students and scope of its work. In April 1931, the name of the institution was changed by legislative enactment to Massachusetts State College. In 1939 the Trustees voted to award the A.B. degree as well as the B.S. which previously had been the undergraduate degree of the College. In May 1947 the College became the University of Massachusetts.

FUNCTIONS OF THE UNIVERSITY

The University of Massachusetts now serves the Commonwealth in the three important fields of resident instruction, research, and extension. Since all three services are organized on the campus, students have the advantages that come through contact with those carrying education to the state at large and conducting original investigation as well as those engaged in formal instruction.

RESIDENT INSTRUCTION

DEGREE COURSES

THE UNDERGRADUATE COLLEGE. The University offers four year undergraduate instruction leading to the following degrees, Bachelor of Science, Bachelor of Arts, Bachelor of Science in Agricultural, Civil, Electrical and Mechanical Engineering, Bachelor of Business Administration and Bachelor of Vocational Agriculture.

This instruction is assigned to the College of Arts and Sciences, the Schools of Agriculture, Business Administration, Engineering, Home Economics and Horticulture, and to the Division of Physical Education. The aim of the four year course is to give as high a degree of proficiency in some particular branch of learning as is possible without sacrificing the breadth, knowledge, and training which should characterize a well-rounded college education.

The Degree of Bachelor of Science is conferred upon those candidates who complete the curriculum requirements of the first two years, the specialization requirements of a Science department, plus additional credits to bring the total Junior-Senior credits to sixty, in Science departments of the College of Arts and Sciences, in the Schools of Agriculture, Horticulture and Home Economics, and in the Division of Physical Education for Men. This degree will also be granted to students majoring in Psychology or Education who elect fifteen credits in the Science departments in the Junior and Senior years.

The degree of Bachelor of Arts is awarded to all candidates in the College of Arts and Sciences who complete their major work in other than any of the Science departments, who complete requirements of the freshman and sophomore years, the departmental specialization requirements of the junior and senior years and enough additional credits to bring the two year total to 60. Students in Science departments may qualify for the A.B. degree by satisfying the requirements of the College of Arts and Sciences for the freshman and sophomore years, completing the departmental requirements in the junior and senior years, and supplementing these with a second year of foreign language and 18 additional credits selected from English, History, Romance Languages, Philosophy, Music and Art.

All graduates from the School of Engineering will receive the appropriate degrees of Bachelor of Science in Civil Engineering, Electrical Engineering, Mechanical Engineering and Agricultural Engineering.

All graduates from the School of Business Administration will receive the degree of Bachelor of Business Administration.

Special arrangements are made for some graduates of county agricultural schools and of agricultural departments of certain high schools to complete the college course with majors in agriculture or horticulture. Upon the completion of their course they will be granted a Bachelor of Vocational Agriculture degree.

THE GRADUATE SCHOOL. Graduate courses leading to advanced degrees are available in the Graduate School. Majors leading to the Master of Science or Doctor of Philosophy degree may be taken in the following fields: Agronomy, Bacteriology, Botany, Chemistry, Economics, Entomology, and Food Technology.

In addition, the following departments offer major work leading to a Master of Science degree only: Agricultural Economics and Farm Management, Animal Husbandry, Business Administration, Dairy Industry, Education, Floriculture, Geology and Mineralogy, Home Economics, Mathematics, Olericulture, Physical Education (Men), Pomology, Poultry Science, Psychology, Romance Languages, Wildlife Management, and Zoology.

The degree of Master of Landscape Architecture is granted to students completing the two years' graduate work offered by the Department of Landscape Architecture; while students taking the equivalent of one year's graduate work in that major may be granted the degree of Bachelor of Landscape Architecture.

Several other departments in the University, while not regularly organized for major work in the Graduate School, do, nevertheless, offer courses which may be selected for minor credit. These are: Engineering, English, French, Forestry, German, History, Philosophy, Physics, Sociology, and Veterinary Science.

The general requirements of the Graduate School regarding entrance, residence, credits, tuition, fees, etc., together with specific information concerning details of interest to prospective students are set down in a separate bulletin which may be obtained upon request from the Director of the Graduate School.

THE SUMMER SCHOOL. A six weeks' Summer Session is available for those desiring to accelerate their program. This Summer Session is planned to serve the needs of (1) all students enrolled as candidates for a degree at any college, (2) those desiring refresher or professional improvement courses, (3) graduate students desirous of meeting specific requirements in certain fields, and (4) any adult person who finds courses suited to his preparation and needs. Applications for the Summer School may be obtained by writing to the Dean of the University.

NON-DEGREE SHORT COURSES

The University, through its Short Course division, as a special service under the Land-Grant Act by which it was established, provides a complete program of two-year technical and vocational courses in the fields of agriculture and horticulture. These train for all types of commercial farming operations as practiced in New England.

Other short courses, varying in length from one to ten weeks, furnish supplementary training for skilled workers in dairy and ice cream plants, milk, laboratories, for city and town sanitary inspectors; tree wardens and foresters, and golf course greenkeepers.

THE STOCKBRIDGE SCHOOL OF AGRICULTURE. This School was organized at the University in 1918 under the name of "The Two Year Course in Practical Agriculture," for the purpose of meeting the demand for shorter courses in agriculture which might be taken by high school graduates who could not satisfy college entrance requirements or who, for one reason or another, were unable to take the four year college course. In 1928 the School was given its present name in honor of Levi Stockbridge, first professor of agriculture in the University and its fifth president.

This program trains men and women primarily for the practice of farming or associated agricultural industries. Graduation from the School does not fulfill the requirements for entrance into the degree course nor are credits earned during the course transferable regularly toward credit for a degree. A diploma is awarded for satisfactory completion of any two-year course; for other short courses certificates are presented.

As the two-year program is now organized a student may choose any one of eleven vocational courses including dairy farming, dairy manufactures or milk plant operation; poultry farming, arboriculture or the care of trees; fine turf maintenance for golf courses, cemeteries, park, and play-grounds; commercial flower growing, both retail and wholesale; food management for clubs, hotels, and restaurants; commercial fruit farming, ornamental horticulture or landscape gardening; commercial vegetable farming, and applied forestry for timber growing and forest products industries.

On-the-job placement training is required of all first year students in the second semester for a period of four to seven months, depending on type of employment. No student can earn diploma of graduation without this applied training experience. Wages earned can pay greater part of second year expenses if the student is forced to economize.

Limited enrollment quotas in each major course make necessary early filing of application. No formal entrance examinations are required for non-degree short courses.

Catalog is available giving complete description of all two-year courses offered in The Stockbridge School of

Agriculture, as well as full details on estimated costs, employment opportunities in each field, and entrance arrangements. Application form is printed in catalog. Write to Director of Short Courses, University of Massachusetts, Amherst, Massachusetts.

NOTE: (For interview or personal conference the Short Course Office is open Monday through Friday from 8:30 to 12:00 and 1:00 to 5:00, state and national holidays excepted.)

RESEARCH AND REGULATORY SERVICES

The University of Massachusetts serves the fields of Agriculture and Horticulture through its Experiment Station which provides research and regulatory services. Experiment Stations were established in all States as the need for development of practical information on subjects relating to Agriculture became apparent. Through the efforts of Experiment Stations a fund of scientific knowledge applicable to Agriculture and Horticulture has been accumulated, and research workers in the Experiment Stations continue to contribute to this knowledge by constant research and experimentation.

At the University of Massachusetts, the Experiment Station service has expanded until it now deals with problems in the following fields of specialization: Agricultural Economics and Farm Management, Agronomy, Animal Husbandry, Bacteriology, Botany, Chemistry, Dairy Industry, Economics, Engineering, Entomology, Horticulture, Floriculture, Food Technology, Nutrition, Olericulture, Pomology, Poultry Science, and Veterinary Science. Most of the research activities of the University of Massachusetts are undertaken at the main Experiment Station at Amherst. There are, however, two substations, one at Waltham, devoted largely to the problems of Horticulture as applied to Olericulture, Floriculture, and Nurseryculture, and one at East Wareham, where attempts are in progress to solve the problems of the cranberry and blueberry growers.

In addition to the work described above, the administration of certain regulatory services, as pertaining to the sale of feeds, fertilizers, and seeds and to the use of dairy glassware, is also assigned to the Experiment Station which is equipped with the necessary laboratory facilities and personnel for that purpose.

EXTENSION SERVICE

The Massachusetts Extension Service is a cooperative teaching effort between the United States Department of Agriculture, the University of Massachusetts and the several counties of the State. It is done through unified teaching programs carried to all parts of Massachusetts. It assists the people of the farm, the home, and the rural communities to improve agriculture, homemaking, and rural life. Extension educational teaching plans are made in council with the

people. They determine their problems and help to suggest methods and practices for their solution.

This cooperative effort was brought about under the Federal Smith-Lever Law passed by Congress on May 8, 1914. Since that time, the service has grown to a staff of over 100 state and county workers who conduct an educational program in all phases of agriculture and homemaking among the adults and young people (4-H club work) of the State. All types of methods, including subject-matter meetings, demonstrations, farm and home visits, publications, visual aids, and radio, are used in carrying out this educational program directly in the farm and rural areas of the State. During the war emergency, the Extension Service extended its home food production and preservation program to the urban areas.

THE UNIVERSITY CAMPUS

The University of Massachusetts is located near the geographical center of the State at Amherst. This town of about 7,000 overlooks one of the most picturesque sections of the Connecticut River Valley. The valley is noted both for its scenic beauty and its educational institutions. The setting for the University, therefore, is ideal. The surrounding county is a rich agricultural region providing an excellent outdoor laboratory for the work in Agriculture and Horticulture as well as for the Biological Sciences and Geology. Those interested in other Sciences and Liberal Arts study under equally favorable conditions both because of the facilities at the University and its location in this educational area of the valley.

Amherst is eighty-seven miles from Boston and may be reached by bus connections from Northampton, Greenfield, Springfield, and Worcester. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. In addition, the University owns another area of seven hundred and fifty-five acres six miles north of the campus on Mount Toby. This is used as a demonstration forest.

The University also operates a horticultural field station at Waltham and a cranberry field station at East Wareham.

BUILDINGS AND EQUIPMENT

The campus is laid out in the form of an oval attractively set off by the College Pond in the center. Around this oval are grouped the main buildings of the University. Those using the attached map of the campus are advised to start at South College, the Administration Building, and proceed in the order indicated below.

SOUTH COLLEGE.—Here are located the administrative offices including those of the President, Dean, Registrar, Treasurer, Secretary, Director of the Extension Service, of Placement Service, the Dean of Women, and the Dean of Men. Erected 1885.

NORTH COLLEGE.—The University Store, offices and classrooms of the School of Business Administration and the Department of Economics. Erected 1868.

FARLEY 4-H CLUB BUILDING AND BOWDITCH LODGE.—Headquarters for 4-H Club Activities. Erected 1933 and 1936 by funds contributed by 4-H Club members and interested friends and organizations. Former was named to honor George L. Farley for twenty-five years State Leader of County Club Agents; the latter for Nathaniel Bowditch, Trustee of the University from 1896-1945.

POWER PLANT—General Maintenance.

LIBERAL ARTS BUILDING.—Classrooms, laboratories and offices for Foreign Languages, Psychology and Education. Erected 1947.

GRINNELL ARENA AND ABATTOIR.—Erected in 1910 primarily for livestock judging. An abattoir was constructed in 1930 as an addition to the original building. Named in honor of James S. Grinnell, for twenty-two years a trustee of the University.

FLINT LABORATORY.—Laboratories and classrooms for Dairy Industry. Erected in 1911 and named for Charles L. Flint, fourth president of the University.

STOCKBRIDGE HALL.—Departments of Agricultural Economics and Farm Management, Agronomy, Animal Husbandry, Engineering and Poultry Husbandry. Erected in 1914 and named for Levi Stockbridge, first Professor of Agriculture and a former President of the University. Bowker Auditorium, the main auditorium of the University, is located here. It is named for William H. Bowker, a member of the first graduating class, a trustee of the University, and one of the pioneers in the fertilizer industry.

CHENOWETH LABORATORY.—Classrooms and laboratories including a large Commercial Canning Practices Laboratory for the Department of Food Technology. Erected 1929 and named in honor of Walter W. Chenoweth, pioneer in the field of Food Technology and first Head of the Department.

NUTRITION LABORATORY.—A laboratory for the study of small animals and chickens in connection with investigations into human, animal, and poultry nutrition.

ENGINEERING ANNEX.—Laboratories, classrooms, and offices for the School of Engineering. Erected 1948.

ENGINEERING SHOP.—Laboratories and shop for machine tools, woodworking, motors, and welding instruction. Erected 1916.

DRAPER HALL.—University Dining Hall. Erected 1903 with an addition in 1912. Named in honor of James Draper, for twenty years a trustee of the University. Annex erected 1947.

COMMONWEALTH CIRCLE.—Five temporary buildings erected in cooperation with the Federal Government to provide additional housing at the time enrollment was rapidly

increasing due to admission of veterans. Accommodates approximately 225 students and includes offices for the Supervisor of University Housing. Erected 1946.

GOESSMANN LABORATORY.—Contains eight large laboratories, an auditorium, chemical library, and lecture rooms. The east wing of the third floor is used by the Experiment Station chemists. The remainder of the building is for resident instruction in Chemistry. Erected in 1924 and named in honor of Charles A. Goessmann, first Professor of Chemistry at the University.

WEST EXPERIMENT STATION.—The State Control Service is centralized here. Fertilizers, seeds, and feeds are analyzed or inspected in accordance with the State law. Erected 1886.

EAST EXPERIMENT STATION.—Here are located the offices of the Director of the Experiment Station and Graduate School and other administrative officials.

ABIGAIL ADAMS HOUSE.—Women's dormitory accommodating one hundred students. Erected in 1919 and named for Abigail Adams, wife of John Adams, second President of the United States.

THE HOMESTEAD.—Girls majoring in Home Economics receive their Home Management practice here. This is a fine old colonial homestead newly equipped with all the modern conveniences of the home.

ALUMNI DORMITORIES.—Two new dormitories being erected in 1949 by the University of Massachusetts Alumni Building Corporation. When completed, they will house approximately 150 each.

LEWIS HOUSE.—Women's dormitory accommodating one hundred and fifty students. A self-liquidating dormitory erected under the sponsorship of the Associate Alumni in 1940 and named in honor of Edward M. Lewis, Dean of the College 1914-25 and President 1925-27.

THATCHER HOUSE.—Women's dormitory with facilities for one hundred and fifty students. Erected in 1935 and named in honor of Roscoe W. Thatcher, President of the College 1927-32.

UNIVERSITY INFIRMARY.—A group of three buildings, one for bed patients, one for out patients and a third for contagious cases.

MARSHALL HALL.—Erected in 1915 and named for Dr. Charles Marshall, a former Professor of Bacteriology and Director of the Graduate School. The building provides laboratories and classroom space for the Department of Bacteriology and the Department of Zoology.

SKINNER HALL.—Laboratories, class rooms and offices for the School of Home Economics. Erected in 1947 and named in honor of Edna L. Skinner, first Dean of the School of Home Economics.

HASBROUCK PHYSICS LABORATORY.—Completed in 1949. Contains laboratories and lecture rooms designed for the various main divisions of Physics. Named in honor of Philip B. Hasbrouck, Professor of Physics and Registrar of the College in the period 1905 to 1924.

FORESTRY SCIENCES.—Formerly the Old Botany Museum erected 1867. Houses laboratories, classrooms and offices for the Departments of Forestry and Wildlife Management.

FISHER LABORATORY.—Erected in 1910 and named for Jabez Fisher, one of the foremost early horticulturists of the State. Laboratories for Pomology. Included are a quick freezing room, six refrigerator rooms, two rooms for the storage of frozen products, two classrooms, and three packing rooms.

WILD LIFE LABORATORY.—Laboratories for the Department of Wild Life Management.

WILDER HALL.—Here are the classrooms, drafting rooms, and offices of the Department of Landscape Architecture. Erected in 1905 and named for Marshall P. Wilder, a pioneer in the movement for agricultural education in Massachusetts, and one of the first trustees of the College.

FRENCH HALL.—French Hall houses the Departments of Floriculture, Forestry, Pomology, and Olericulture. In the rear of the building is the new Durfee range of greenhouses devoted to the growing of carnations, roses, chrysanthemums, etc. One house is maintained as a conservatory and contains a collection of plants used primarily for decorative purposes. The old Durfee range just north of French includes a collection of tropical and semi-tropical plants of botanical and horticultural importance.

STOCKBRIDGE HOUSE.—Faculty Club House. On the rear of the Stockbridge House is a new wing added in 1948 to house the research laboratories and staff engaged in control of the Dutch Elm Disease.

CLARK HALL.—Offices, lecture rooms, laboratories, and greenhouses of the Department of Botany are located here. The herbarium contains about twenty thousand sheets of seed plants and ferns, twelve hundred sheets of liverworts and mosses, and a collection of twenty-five thousand specimens of fungi. The building was erected in 1906 and named in honor of William S. Clark, President of the College and Professor of Botany from 1867 to 1879.

FERNALD HALL.—Erected in 1909 and named in honor of Professor Charles H. Fernald who served the College from 1886 to 1909, built up a strong Department of Zoology, created the Department of Entomology, and acted as Director of the Graduate School. Fernald Hall houses the Departments of Entomology and Geology and offices and classrooms of the Department of Zoology. Offices and laboratories of the Western Sanitary District, Massachusetts Department of Public Health are also located here. The Entomology

collection includes over 160,000 insects. There are also Geological and Zoological museums.

MATHEMATICS BUILDING.—Classrooms and offices of the Mathematics Department.

MILLS HOUSE.—Men's dormitory for one hundred and fifty students. A self-liquidating dormitory erected in 1948 under the sponsorship of the Associate Alumni. Named in honor of George F. Mills, teacher of English from 1899 to 1914 and Head of the Division of Humanities.

BUTTERFIELD HOUSE.—Men's dormitory including Dining Hall. Accommodates one hundred and fifty students. A self-liquidating dormitory erected in 1941 under the sponsorship of the Associate Alumni. Named in honor of Kenyon L. Butterfield, President of the College 1906-1923.

CHADBOURNE HOUSE.—Men's dormitory for one hundred and fifty students. A self-liquidating dormitory erected in 1946 under the sponsorship of the Associate Alumni. Named in honor of Paul Ansel Chadbourne, President 1866-67 and 1882-83.

GREENOUGH HOUSE.—Men's dormitory and Dining Hall. Houses one hundred and forty-eight students. A self-liquidating dormitory erected in 1946 under the sponsorship of the Associate Alumni. Named in honor of James Carruthers Greenough, President from 1883-86.

PAIGE LABORATORY.—The work in Veterinary Science is located here. In addition to class, lecture, and laboratory rooms, there are laboratories for the State Control and Research Work in animal diseases. The museum contains a growing number of anatomical and pathological specimens, most of which are used for teaching purposes. Erected in 1898 and named for James B. Paige, Professor of Veterinary Science from 1891-1922.

CURRY S. HICKS PHYSICAL EDUCATION BUILDING.—Erected in 1931 from funds contributed by Alumni and friends of the College plus an appropriation by the State Legislature. Contains a large swimming pool, an exercise hall, basketball floor, and locker rooms. The Health Office and x-ray room are also located here. Named for Curry S. Hicks, Professor of Physical Education since 1911.

ALUMNI FIELD.—So called because both funds and labor for its construction were contributed by alumni and students. Included are a baseball diamond, football and soccer fields, and a cinder track. Ten tennis courts are adjacent to the Physical Education Building.

ATHLETIC FIELD FOR WOMEN.—A large field west of the Physical Educational Building provides space for Archery, Softball, Field Hockey, and other women's activities.

FEDERAL CIRCLE.—A series of temporary buildings furnishing ninety-four apartments of varying size for married veterans. Erected in 1946 in cooperation with the Federal Government.

COUNTY CIRCLE.—Five residence halls erected in 1948 by the Commonwealth. Hampshire and Suffolk Houses contain thirty two and three room apartments for married persons and their families. Plymouth, Berkshire, and Middlesex Houses contain dormitory rooms for approximately 144 students each.

COLLEGE ARMORY.—Contains, in addition to the offices of the Department of Military Science, the offices, locker and dressing rooms, and exercise hall for the Department of Physical Education for Women.

MEMORIAL HALL.—Erected in 1921 by Alumni and friends in memory of those men of the College who died in World War I. Included is a Memorial Room in which the names of those members of the College family who died in the service of their country are appropriately enshrined. This building is a social center of student life. Alumni headquarters are here as well as the offices of student organizations including the Senate, Collegian, and Index. The Associate Alumni are, at the present time, in the process of raising a fund to add a large wing to this building. The purpose of the new wing is to commemorate the sacrifices made by our college men who gave their lives for their country in World War II.

OLD CHAPEL.—Erected in 1885. Auditorium, seminar room, classrooms, and offices for English, History and Sociology.

GOODELL LIBRARY.—Goodell Library is named in honor of Henry Hill Goodell who served the College from 1867-1905. He was President from 1886 to 1905 and because of his deep enthusiasm for books also acted as Librarian of the College.

Goodell Library is a virtually fireproof building erected in 1935. Its plan is unique in that the book-stacks are open freely for inspection and borrowing.

The main floor includes a large reading room, a reference room, delivery desk, cataloging and administrative offices. On the second floor is another large reading room, commonly used for reserve book reading. There are also studies for faculty and students and the University of Massachusetts Memorabilia room.

Besides Goodell Library there are fifty-two departmental libraries ranging from small collections to sizable separate libraries with reading rooms and valuable collections of reference and text books.

The complete library system contains 150,000 volumes and is growing at the rate of over 4,000 volumes a year. The library regularly receives over 600 periodicals, and also the serial publications of learned societies. It is also a depository for government documents of the United States Department of Agriculture and the various State Experiment Stations.

INFORMATION CONCERNING THE UNIVERSITY COURSE

The sections of the catalogue that follow are primarily for undergraduate students in the four year degree course. Those interested in graduate study are referred to the Graduate School catalogue and in short courses to the catalogue of the Stockbridge School of Agriculture and other short course publications.

STUDENT EXPENSES

Expenses vary from approximately \$750 to \$850 per year for the normally economical student. First year costs are usually greater than those of the other three years and there is less opportunity to earn. A student is advised to have a definite plan for meeting the expenses of the first year before entering.

The following estimate of a year's expenses, based upon last year's costs, includes only those items which are strictly college and does not include amounts for clothing, laundry, travel, etc. These costs vary slightly from year to year. Tuition for residents of Massachusetts is \$100 per year and for others \$400.

	Normal
Tuition (citizens of Massachusetts)	\$100.00
Room in college dormitory or private home (ave.)	150.00
Board at University Dining Hall	425.00
Books, stationery, and other supplies	90.00
Student Tax (approx.)	38.50
	\$803.50

INITIAL PAYMENT FOR FRESHMEN

The initial payment required of freshmen at the time of fall registration is indicated below and is made up of the following items:

Tuition (citizens of Massachusetts)	\$50.00
Room rent (dormitory) (approximately)	75.00
Board (University Dining Hall)	145.00
Military Uniform (men students)	30.00
Student Tax	20.00
Books, Stationery, etc.	45.00
	\$365.00

The above are only approximate figures. A bill will be rendered to the parent of each student prior to the opening of the University.

TUITION.—As a state institution the University of Massachusetts offers a low rate of tuition to all students entering from the Commonwealth. Eligibility for admission under the low residential rate is determined in accordance with the following policy established by the Board of Trustees.

A student must present evidence satisfactory to the Treasurer of the University that his domicile is in the Commonwealth of Massachusetts in order to be considered eligible to register in the University as a resident student. This means that he must have established a *bona fide* residence in the Commonwealth with the intention of continuing to maintain it as such.

The domicile of a minor shall follow that of the parents unless such minor has been emancipated. In case of emancipation the student, in addition to the requirements of these regulations respecting residence, shall present satisfactory proof respecting emancipation. Minors under guardianship shall be required to present, in addition to the certification of the domicile of the guardian, satisfactory documentary evidence of the appointment of the guardian.

No student shall be considered to have gained residence by reason of his attendance in the University nor shall a student lose residential preference during his continuous attendance at the University.

The residence of a wife shall follow that of the husband.

The prescribed form of application for classification as to residence status must be executed by each student. Misrepresentation of facts in order to evade the payment of out-of-state tuition shall be considered sufficient cause for suspension or permanent exclusion from the University.

Discretion to adjust individual cases within the spirit of these rules is lodged with the President of the University.

BOARD.—The University provides three dining halls for students at Butterfield House, Greenough House and Draper Hall. The dining halls at Butterfield and Greenough dormitories are intended primarily to provide for students housed in that area, including residents of Chadbourne, Mills and Brooks Houses.

All freshmen except commuters will be required to board at University dining halls on a five-day week basis.

Sophomores and juniors residing in University dormitories and other campus buildings will also be required to board at University Dining Halls except that such students who are members of fraternities or sororities may be permitted upon request to board at their respective fraternities or sororities.

Any student who wishes may board at University dining halls on the ticket plan or cash basis.

MILITARY UNIFORM.—All students taking military drill are required to make a deposit of \$30 for the uniform. A rebate of this amount is made when the uniform is returned.

STUDENT ACTIVITY TAX.—This tax, authorized by vote of the undergraduate students with the approval of the Board of Trustees, provides each student with the Collegian, the student newspaper; Index, University annual; Social Union privileges, student government, class and other activities.

ADVANCE PAYMENT

New students will be expected to make an advance payment of \$15 to the Treasurer of the University as soon as they are notified by the Registrar that they are accepted for admission. This will be considered as first payment on registration fees which will be due at time of matriculation in September. It is not refundable and will be considered as payment for admissions and registration expense if the student does not matriculate.

REFUNDS

A student who leaves the University for any reason before a semester is half completed will have refunded to him one-half the fees paid for that semester, but one who leaves after a semester is half over will be allowed no rebate of fees. There will be no refund of prepaid rent.

WHEN PAYMENTS ARE DUE

In accordance with policy established by the Board of Trustees, all charges for tuition, fees, board, and room rent in University dormitories are due at the beginning of each semester and must be paid on or before the opening date of each semester. Bills will be rendered in advance, and payment may best be made by mail. Students may not attend classes until registration charges are paid.

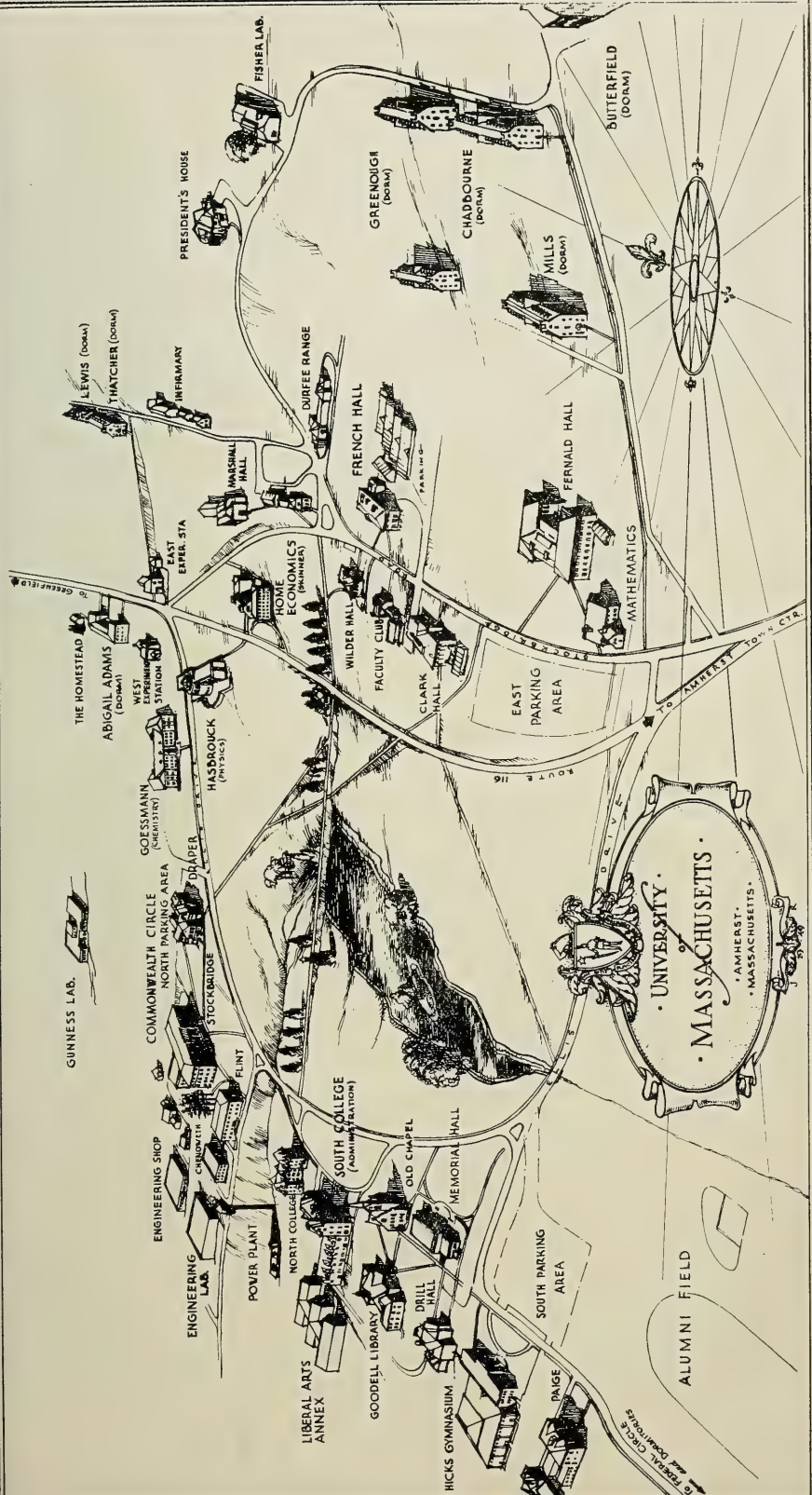
LATE REGISTRATION

Any student who does not complete his registration, including payment of semester charges on the regular registration days will be required to pay a fine of five dollars.

FINANCIAL REQUIREMENTS FOR GRADUATION OR HONORABLE DISMISSAL

Diplomas, transcripts of record, and letters of honorable dismissal will be withheld from all students who have not paid all bills and all loans due the University or all legitimate bills for room rent and board due fraternities or private individuals. All such bills due the University must be paid ten days preceding Commencement. If paid after that date and the student is otherwise eligible, he may graduate the following year.

Private creditors of students must present itemized statements of charges to the Treasurer of the University at least 15 days before graduation if they wish to have their claims recognized by the University.



MAP OF STATE UNIVERSITY CAMPUS NEAR GEOGRAPHICAL CENTER OF MASSACHUSETTS



BUTTERFIELD DORMITORY FOR FRESHMEN



LEWIS AND THATCHER DORMITORIES FOR WOMEN

FINANCIAL AID

Scholarships, loans, and part-time employment are available for a limited number of needy and deserving students.

AID FOR FRESHMAN YEAR.—Freshmen are eligible for scholarships and part-time employment. A freshman also becomes eligible for assistance from loan funds after satisfactorily completing one semester of academic work. Scholarship application blanks may be secured from the Registrar and should be filed by May 1. Part-time employment application forms may be obtained from the Director of Placement Service and filed after a candidate has been accepted for admission.

Because of the time required for preparation of studies, few students should plan to spend more than ten hours per week in part-time employment.

AID FOR UPPERCLASSMEN.—To become eligible for financial assistance, whether scholarship, loan, or part-time employment students must file completed financial aid application forms with the Student Aid Committee in the Placement Service office by June 1 previous to the college year for which assistance is asked.

SCHOLARSHIPS

Scholarships are awarded only to needy and deserving students of high character whose habits of life are economical and whose scholastic records are satisfactory. A limited number of these scholarships are available for entering freshmen.

Scholarships are paid in installments at the beginning of each semester in the form of a credit on the student's bill. A scholarship may be discontinued at the close of any semester if the scholastic record of the recipient is unsatisfactory.

If a scholarship student withdraws from the University, any refund of University fees or charges must first be applied to reimburse the scholarship fund for the full amount of the scholarship received by the student for the semester.

The following scholarships are available:

ALVORD DAIRY SCHOLARSHIP.—for a worthy student specializing in the study of Dairy Husbandry with the intention of becoming an investigator, teacher or special practitioner in connection with the dairy industry.

DANFORTH KEYES BANGS SCHOLARSHIP.—for the aid of industrious and deserving students.

CHI OMEGA AWARD.—The local chapter of the Chi Omega Sorority offers an annual scholarship of twenty-five dollars to that woman student majoring in the department of economics or psychology who has the highest scholastic average at the end of the first semester of the senior year.

- LUCIUS CLAPP FUND.**—to provide scholarships and loans to deserving students.
- CLASS OF 1882 SCHOLARSHIP.**—for the aid of a worthy student of the junior or senior class.
- FREDERICK G. CRANE SCHOLARSHIPS.**—for the aid of worthy undergraduate students, preference being given to residents of Berkshire County.
- J. D. W. FRENCH SCHOLARSHIPS.**—for deserving students in dairying and allied subjects; also Forestry.
- HENRY GASSETT SCHOLARSHIP.**—for a worthy undergraduate student.
- CHARLES A. GLEASON SCHOLARSHIPS.**—general scholarship for worthy students.
- CHARLES H. HOOD DAIRY SCHOLARSHIPS.**—An unusual grant of \$400 for two scholarships to be awarded to seniors whose ultimate object is the operation of their own dairy farms.
- LOTTA SCHOLARSHIPS.**—The Trustees of the Lotta Crabtree Agricultural Fund have made available a substantial sum for scholarships. These are limited to students registered in the Schools of Agriculture, Home Economics, Horticulture and Science. One-fourth of the amount granted is awarded to freshmen.
- MARGARET F. MOTLEY SCHOLARSHIP.**—one scholarship of \$100 for an upperclass student studying Horticulture, Landscape Architecture or Floriculture.
- PORTER L. NEWTON SCHOLARSHIPS.**—for the aid of worthy and deserving students in the field of agriculture.
- BETSEY C. PINKERTON SCHOLARSHIPS.**—two general scholarships for graduates of the schools of the city of Worcester.
- SEARS SCHOLARSHIPS.**—The Sears Roebuck Company provides for eight scholarships of \$125 each which are awarded annually to deserving students in the freshman class who desire to major in agriculture.
- WHITING STREET SCHOLARSHIPS.**—Scholarships of fifty dollars each for deserving students.
- HELEN A. WHITTIER SCHOLARSHIP.**—for a deserving woman student in art as applied to living.

There are also the following special scholarships:

- COTTING MEMORIAL SCHOLARSHIP.**—all college expenses of freshman year—for a woman student. Recipient of this scholarship is selected by a committee of the New England Branch of the Farm and Garden Association from among candidates proposed by State Leaders of 4-H Club work in the New England states.
- WILBUR H. H. WARD SCHOLARSHIPS.**—Twenty-five scholarships of approximately \$100 known as the Wilbur H. H. Ward Scholarships. The Wilbur H. H. Ward Fund is administered by a Board of Trustees independent of the University. Applicants for these scholarships should write

to Sumner R. Parker, who may be addressed at the University. They are available only to Hampshire County boys.

WOMEN'S STUDENT GOVERNMENT AWARD.—An award by the Women's Student Government Association to a young woman student at the end of her junior year. This award is made on the basis of character and personality, scholastic achievement, campus influence and service.

GEORGE L. FARLEY SCHOLARSHIPS.—The Massachusetts Society for Promoting Agriculture has established a scholarship in memory of George L. Farley. The income of approximately \$60 per semester is awarded to deserving 4-H Club members, men or women, recommended by the State Leader of 4-H Clubs from applications submitted to County 4-H Club Agents.

ESSO 4-H SCHOLARSHIP.—The Colonial Beacon Oil Company, each year, awards a \$400 scholarship payable \$100 per year to a 4-H Club member enrolled in some course related to agriculture. Selection is on the basis of need, merit and ability. Application should be sent to County 4-H Club Agents.

THE BORDEN COMPANY FOUNDATION.—Provides an annual Scholarship Award of \$300 to that senior student in Agriculture who has achieved the highest average grade in all college work preceding the senior year. No student whose curriculum did not include at least two courses in Dairy subjects is eligible.

NEVILLE STURGIS SCHOLARSHIPS.—The income from a trust set up under the trusteeship of DeBlois and Maddison by Neville Sturgis of Weston, amounting to approximately \$1700 annually. This income is to be used in aiding deserving undergraduate students of the University.

ASCENSION FARM SCHOOL SCHOLARSHIPS.—The trustees of the Ascension Farm School offer annually approximately \$2400 for scholarships. These are restricted to men from Western Massachusetts who are studying in the fields of Agriculture and Horticulture.

LOANS

Through the generosity of friends of the University, funds have been donated to provide loans for a limited number of students of the three upper classes to assist in paying tuition or other college expenses. These loans are granted, after proper consideration, to needy students of good scholarship whose habits are economical. All loans are secured by a note endorsed by a responsible party as collateral. All such loans must be paid before graduation. Upon withdrawal from the University, loans automatically become due. Interest is charged at the rate of 3% to maturity, 5% thereafter on loans from all funds except the Lotta Agricultural Fund, from which loans are made without interest.

Application for loans should be made to the Student Aid Committee, Placement Service Office, South College. No loan will be granted in excess of \$200 in any one year.

If funds are available at the beginning of the second semester, loans may be made in exceptional cases to members of the Freshman class whose scholastic record is satisfactory and whose budget calculations have been upset through circumstances beyond their control.

DANFORTH KEYES BANGS FUND.—This is a gift of \$6,000 from Louisa A. Baker of Amherst, the income of which is used in aiding poor, industrious and deserving students to obtain an education in the University of Massachusetts.

LOTTA AGRICULTURAL FUND.—A limited number of loans are made to students from the income of this fund. Such loans are made without interest but only to deserving students of high scholastic rank. This fund is administered by a Board of Trustees independent of the University although loans are made only upon the recommendation of the President of the University.

VINCENT GOLDTHWAIT MEMORIAL LOAN FUND.—A gift of \$5,000 from Dr. Joel E. Goldthwait in memory of his son. This fund is used almost entirely for students in the Stockbridge School of Agriculture.

FRANK A. WAUGH FOUNDATION.—Graduates of the Department of Landscape Architecture and friends of Professor Frank Waugh have established this fund, to be used in part for loans to deserving seniors and fifth year students of that department. Requests for loans shall be reviewed and approved by the head of the department of Landscape Architecture and submitted to the Board of Trustees of the Foundation, who shall make final decision as to granting of the loans and amounts thereof.

4-H SCHOLARSHIP AND LOAN FUND.—This fund is under the supervision of the State Leader of the 4-H Clubs and is used to aid students preparing for agricultural and home economics service.

NATIONAL PEST CONTROL ASSOCIATION LOAN FUND.—A fund established by the National Pest Control Association for needy students in the field of Entomology.

PART-TIME EMPLOYMENT

The Placement Service is the clearing center for all part-time jobs of the University. Students are assisted in obtaining part-time work during the College year and full-time work during the summer vacation. Employment is not guaranteed but every effort is made to help those students who must work to meet their college expenses. This Office also maintains a Placement Service for graduates of the University.

In order to give assistance to as many needy students as possible, the Student Aid Committee has adopted the policy of limiting the maximum financial aid per student to the equivalent of board, or approximately \$300. The average earnings of students engaged in part-time work is approximately \$100 per student per year.

Personnel of the Placement Office also act in an advisory capacity for students studying under the provisions of Public Laws 16 and 346. Veterans enrolled under these laws file their Eligibility certificates with the Placement Office and may obtain recommendations concerning their transactions with the Veterans Administration.

STUDENT LIFE AND WELFARE HEALTH SERVICE

The University endeavors to safeguard the health of all students while on the campus and for this purpose maintains a Department of Student Health staffed by two physicians and four resident registered nurses, and a group of three infirmary buildings.

- (1) Physical examination by the Health Service is required of all entering freshmen, reentering students, and all students participating in athletics. This examination is given to freshmen during matriculation week. Evidence of a SUCCESSFUL small-pox vaccination is required.
- (2) The Student Health physicians have offices in the Physical Education Building and in the out-patient Infirmary Building, where they may be consulted during college hours.
- (3) The Infirmary consists of 3 buildings, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by one of the Student Health physicians.
- (4) The students are urged to consult the resident physicians at the first sign of physical disorder, or even for minor accidents. Many severe illnesses and much lost time may be avoided by early or preventive treatment.
- (5) No charge is made to Infirmary bed patients for the first seven days in the school year; time in excess of seven days will be charged at the rate of \$4 per day. A nominal charge may be made to out-patients for miscellaneous treatments.
- (6) In addition to the fee charged as specified in paragraph 5, the following additional expenses will be charged to the patient.
 - (a) *Nurses*.—If a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient.

Such a nurse will be under the general supervision of the resident nurse.

- (b) *Professional Service*.—If a student requires continuous medical attention by a physician, he may be required to select a town physician and become responsible for fees charged by that physician.
 - (c) *Supplies*.—Special medical supplies prescribed by a physician will be charged to the patient.
 - (d) *Laundry*.—Expenses for personal laundry incurred by students while in the infirmary will be charged to the individual student.
- (7) The Health Service recommends strongly that students participate in the blanket insurance program described in literature accompanying the initial bill rendered students each year.

STUDENT HOUSING

It is the policy of the Board of Trustees that freshmen men and women students shall be housed in campus dormitories and be required to eat at University Dining Halls unless given permission to commute. Sophomore and upper-class students will also be required to live in University dormitories in so far as accommodations are available. Those who cannot be so housed will be given permission to live in fraternity or sorority houses or in private homes.

Students who are assigned to housing operated by the University, or homes approved by the University, are expected to occupy them for the entire school year and may not be released sooner except as their places are taken by suitable substitutes.

Dormitories will be open for occupancy on Sunday at 1:00 P.M. preceding the opening of the University.

Rooms are furnished except for necessary bedding and linen and are cared for by the students occupying them. Each occupant is held responsible for any damage.

All student property must be removed from the rooms and key turned in to the Treasurer's Office immediately after final examinations in June. Such property not removed by the owner will be removed by the University and stored at the owner's expense.

The general supervision of the housing conditions of all students is in charge of the Faculty Committee on Housing.

ROOMS FOR WOMEN STUDENTS.—Dormitory rooms are available for women students at Lewis and Thatcher Halls and Abigail Adams House.

Under the supervision of the Dean of Women, life in each dormitory is directed by a council of student leaders, advised by a full-time Housemother, so that conditions in the residence

hall are conducive to study and good living habits. Through Women's branch of the Student Government, the responsibility is put upon each student to live according to her own best standards as well as according to the standards of the group.

Freshmen girls will be assigned rooms in the dormitories and will be notified of the assignment prior to the beginning of college.

Near the close of each year, Freshman and upperclass women will draw numbers to determine the order in which rooms may be chosen for the coming year.

The Dean of Women may permit students to live off-campus for the reason that they wish to live at home, or in a sorority house, or that they have an opportunity to earn room and board in a private home.

ROOMS FOR MEN STUDENTS.—Dormitory rooms are available for men students at Butterfield House, Mills House, Greenough and Chadbourne and Brooks Halls, Berkshire, Plymouth, and Middlesex Houses, Commonwealth Circle, and other new dormitories.

All first year men students will be assigned to campus dormitories. Upperclassmen should make dormitory room reservations at the Housing Office before May 1. Those who cannot be accommodated in dormitories, will be given permission to live in fraternities or private homes. Assignment of dormitory rooms will be under the supervision of the Housing Office.

ROOMS FOR MARRIED STUDENTS.—The University cannot guarantee facilities for married students. However, those married students who can be accommodated will be housed in Federal Circle or the University Apartment Units. Assignments are under the direction of the Housing Office and all inquiries should be addressed to that office. Some students may be able to locate rooms or apartments off-campus.

ADVISORY SYSTEM

In order that from the day he enrolls the freshman may have some one to whom he may go for consultation and assistance, each student, at the time of registration, is assigned to a faculty adviser. It is the function of this adviser to help the student in adjusting himself to the work and life of the University. Academic progress reports, issued by the Registrar's Office, are sent to the advisers periodically, and the students are expected to report to their advisers from time to time to discuss their academic standing. The adviser also forwards reports of academic standing to the parents. Both students and parents are encouraged to consult with the adviser whenever there are problems regarding studies or personal adjustment to college life.

At the beginning of the second semester of the freshman year each student will discuss his vocational and

specialization plans with his adviser. If he can decide definitely upon the department in which he wishes to specialize, and the adviser approves, the student takes his election card to the head of that department for approval. In cases where students are not ready to designate a department of specialization they continue as general majors during the sophomore year under the direction of an adviser assigned by the head of the School in which the student is enrolled. Such general majors must select their field of specialization by the end of the sophomore year.

During the junior and senior years the student is under the guidance of the head of the department in which he is majoring or an adviser assigned by him.

RELIGIOUS LIFE

The University makes an effort to provide a wholesome and stimulating spiritual atmosphere for its students by co-operating with official agencies of the three faiths most largely represented at the University.

On the campus the religious life of Catholic students is enriched by the Newman Club, of which Father David J. Powers of Saint Brigid's Parish is chaplain; Jewish students may participate in services and activities at the local Hillel House, under the chaplaincy of Rabbi Louis Ruchames of Northampton; and Protestant students may join in worship and other religious activities conducted by the Student Christian Association, under the guidance of the Reverend Arnold M. Kenseth, chaplain to Protestant students.

In town, the churches of Amherst provide not only the usual opportunities for worship and participation in church work, but special events for students. Students are particularly encouraged to attend Sunday service in the local churches of their respective faiths.

STANDARDS OF DEPORTMENT

The customary high standard of college men and women in honor, self-respect and consideration for the rights of others constitutes the ideals of student deportment.

The privileges of the University may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the University, acting through its President, or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which they may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as student be not affected. The same provision applies equally to the matter of absences. According to the rules, juniors and seniors are allowed a certain percentage of absences from class and other exercises.

This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet if, in the judgment of the University authorities, a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

Hazing in the sense of the punishment or humiliation of students is not permitted.

ACADEMIC REGULATIONS FRESHMAN WEEK

All members of the incoming freshman class are required to be in residence on the campus for the period known as Freshman Week. During this period an attempt will be made to orient the student. He will be given psychological and mental tests, and a physical examination. Schedules and section assignments will also be arranged. In addition there will be lectures on student activities, customs, and curricula, and a scheduled meeting with the student's adviser.

REGISTRATION

Every student must report for registration on the appointed day. All late registrants must pay a \$5.00 fine. No student will be admitted to any class until he has completed the prescribed registration procedure. Changes of courses on the registration card shall be made only by the Registrar's Office.

No course will be recorded on the permanent records of the University nor will a student receive credit for it, unless such course appears on the registration card for the semester and has been properly countersigned by the instructor.

ADDING OR DROPPING COURSES

A student may not add or drop a course except with the approval of the Registrar. A course dropped without approval will be recorded as a failure.

CHANGE OF MAJOR

A student wishing to change his major must get a Change of Major card at the Registrar's Office. This change is to be approved by the head of the Department or School in which he is now majoring and also by his new major adviser. This card, properly indorsed, must be returned to the Registrar's Office before the change receives final approval.

MARKING SYSTEM

All grading is done on a numerical basis with 60 per cent the passing grade. A student whose daily work in any course is entirely unsatisfactory will not be permitted to take the

final examination in the course and is automatically failed. If he takes the final examination and fails to pass, the instructor may report either a condition (‡) or failure (F). To remove a condition, the student will have an opportunity to take a condition examination or he may repeat the course. A failed course must be repeated unless permission to substitute another course is granted by the Committee on Scholarship.

The scholastic record of each student is reported to his parents at the end of each semester. Mid-semester marks are sent to parents for the first semester only. A complete report of the scholarship record of each student during his first semester is sent to the principal of the school from which the student entered.

TRANSCRIPTS

Two transcripts of a student's record will be furnished without cost. For each three additional copies there will be a charge of one dollar.

CONVOCATIONS

Throughout the year each School and Division of the University conducts convocation programs which are especially designed to give students opportunities of hearing from leaders in Science, Art, Government, Education, etc. Some of the convocations are devoted to student activities such as debates, declamation contests, band and musical concerts.

STUDENT ORGANIZATIONS

One of the values received from the University course is the training one acquires through participation in student activities. Student organizations offer excellent opportunities for development of leadership and broadening of outlook.

STUDENT GOVERNMENT

The student Senate operating under the student constitution and composed of elected representatives from the student body is the governing council of undergraduates. Its aim is to promote the general welfare of the University and, in doing so, groups of both students and faculty meet to further their mutual interests. The student Senate directs student conduct and represents the interests of the student body before the faculty.

ACADEMIC HONOR SOCIETIES

PHI KAPPA PHI.—The Massachusetts Chapter of the Honor Society of Phi Kappa Phi was installed on the campus in 1904. Its prime object is to emphasize scholarship and character. Senior students from all departments of the University are eligible for election to membership provided the scholastic and character requirements of the Society are met.

SIGMA XI.—The Society of Sigma XI is a scientific fraternity to which members are elected on the basis of outstanding scientific research. The local chapter was established in 1938.

STUDENT HONORARY SOCIETIES

ADELPHIA.—A men's senior honorary society, recognizing men students who have been prominent in the extra curricular activities of the campus.

ISOGEN.—A women's senior honorary society. Its purpose is to recognize outstanding women students on the campus.

FRATERNITIES AND SORORITIES

Social fraternities on the campus include Alpha Epsilon Pi, Alpha Gamma Rho, Kappa Sigma, Lambda Chi Alpha, Phi Sigma Kappa, Q.T.V., Sigma Alpha Epsilon, Sigma Phi Epsilon, Tau Epsilon Phi, and Theta Chi. An Inter-Fraternity council, consisting of representatives of these fraternities, has charge of rushing and all general matters dealing with fraternity life.

Sororities include Chi Omega, Kappa Alpha Theta, Kappa Kappa Gamma, Pi Beta Phi, Sigma Delta Tau, and Sigma Kappa. The Pan-Hellenic Council, made up of representatives from the sororities, supervises rushing and other sorority matters.

ACADEMIC ACTIVITIES

THE COLLEGIAN.—This is a weekly newspaper published by undergraduates.

THE QUARTERLY.—A magazine in which the literary and artistic efforts of the students are published.

INDEX.—The Year Book.

UNIVERSITY HANDBOOK.—Published annually as a campus book of reference.

The University Musical Clubs include an orchestra, a band, and men's and women's glee clubs. These make various public appearances during the school year both on and off campus.

The Dramatic Club, the Roister Doisters, presents three productions each season. The women's Drill Team accompanies the band at all home football games. All academic activities are supervised by the Academic Activities Board composed of alumni, faculty, and students, and find recognition in the annual award of gold and silver medals.

INTER-COLLEGIATE ATHLETICS

The University is represented in inter-collegiate athletics by teams in all the leading sports, including football, baseball, track, hockey, soccer, swimming and basketball. General policies governing athletics are directed by the Athletic Board, composed of alumni, faculty, and students.

PROFESSIONAL CLUBS

There are numerous professional clubs established in connection with the various major courses of study. These clubs stimulate the students' professional interest in their chosen subject-matter fields and afford opportunity for discussion of technical subjects of mutual interest.

HONORS, PRIZES, AWARDS

SCHOLARSHIP HONORS

DEAN'S SCHOLARSHIP GROUPS.—At the beginning of each semester a list is posted of those students who during the previous semester made a general average of 80 per cent or better. Three groups are recognized: those between 90 and 100; those between 85 and 90; and those between 80 and 85. Sophomores, juniors and seniors in the first two groups are allowed considerable freedom in the matter of class attendance.

DEPARTMENTAL HONORS.—A student who has shown outstanding promise within some department and has maintained a general scholastic average of 80 percent or better is permitted to apply for the privilege of registering for departmental honors. If his application is accepted by his department and the Honors Committee, he is allowed to pursue a course of independent study within the department of his choice throughout his senior year. This may include intensive reading, investigation or laboratory work in connection with some problem that he chooses for his consideration. The objective is to create on the part of the student initiative, the power of independent investigation and to develop in him the spirit of research. Although the student is responsible for his undertaking he is encouraged to consult with his department in regard to his work should the need arise. At the close of his study the student presents a thesis covering his investigation. In addition he may be required to appear for an oral or written examination. If by the excellence of his work he satisfies all the requirements of his department and the Honors Committee, his name will appear on the commencement program as receiving honors in the field of his specialization.

SCHOLASTIC PRIZES

PHI KAPPA PHI AWARD FOR SCHOLARSHIP.—Massachusetts Chapter of the Phi Kappa Phi, honorary scholarship society, offers an award of \$50 for outstanding work in scholarship. This is given to some member of the senior class at the opening of school in the fall. The award is based on the record of the first three years.

THE BURNHAM PRIZES.—These were made possible through the generosity of Mr. T. O. H. P. Burnham of Boston. Prizes of \$15 and \$10 are awarded to those students

delivering the best and second best declamations in the Burnham contest. The preliminary contests are open under certain restrictions to freshmen and sophomores.

THE FLINT PRIZES.—The Flint Oratorical Contest was established in 1881 by a gift of the late Charles L. Flint, a former president of the College. After his death the prizes were continued by college appropriation. Prizes of \$30 and \$15 are awarded as first and second prizes to those two students delivering the best orations in this contest.

THE HILLS BOTANICAL PRIZE.—This is given through the generosity of Henry F. and Leonard M. Hills of Amherst, for the first and second best herbaria. Competition is open to members of the senior, junior and sophomore classes. First prize \$20, second prize \$15.

THE BETTY STEINBUGLER PRIZE IN ENGLISH.—This prize was endowed by John L. Steinbugler, New York City, in honor of his daughter Elizabeth Steinbugler Robertson, a graduate of this College in 1929. It is awarded to a woman in the junior or senior class who has written the best long paper on a subject of literary investigation in a course in English during the year.

MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE PRIZES.—Three prizes of \$25, \$15, and \$10 to be awarded to those senior students who are judged to have made the best records in the theoretical and practical work in agriculture required in their course of study, and in the special written and oral examination prepared for the purpose of this award.

ATHLETIC AND ACADEMIC PRIZES

THE ALLAN LEON POND MEMORIAL MEDAL.—This medal is awarded for general excellence in football in memory of Allan Leon Pond of the class of 1920, who died February 26, 1920. He was a congenial companion, a devoted lover of Alma Mater, a veteran of World War I, a fine all-round athlete and a true amateur. He would rather win than lose, but he would rather play fair than win. He has been characterized as a typical student of this College.

THE WILLIAM T. EVANS MEMORIAL TROPHY.—This trophy is given each year to that member of the varsity football team who through his sportsmanship, football ability, character and personality, has thus exemplified the character and spirit of the person in whose memory this memorial trophy is dedicated. The trophy is dedicated to the memory of William T. Evans, a former member of the class of 1942, who died December 9, 1941. This trophy is presented annually by the class of 1942.

THE THOMAS E. MINKSTEIN MEMORIAL AWARD.—This award is made by the class of 1931 in memory of their classmate who died July 16, 1930 while he was captain-elect of football. The award is given to one of the outstanding men

in the Junior Class who has as nearly as possible attained those standards of athletics, scholarship and leadership set by him whose memory this award honors.

THE GEORGE HENRY RICHARDS MEMORIAL CUP.—This cup is awarded annually to the member of the basketball team who shows the greatest improvement in leadership, sportsmanship, and individual and team play during the year. It is in memory of George Henry Richards of the Class of 1921 who died suddenly while a student at the College.

THE JOSEPH LOJKO MEMORIAL PLAQUE.—This plaque is presented to a senior who must be a letter man, have a satisfactory scholastic record and show those qualities of enthusiasm and cooperation which make for leadership. An award in honor of Joseph Lojko of the Class of 1934, outstanding athlete who died while a senior in the College.

THE SAMUEL B. SAMUELS BASKETBALL CUP.—This cup is presented annually in the name of Samuel B. Samuels of the Class of 1925 who was an outstanding basketball player during the early years of basketball as a varsity sport at the University. The trophy is awarded to that letter man who is a regular member of the varsity basketball team and who has performed with excellence during scheduled varsity games.

THE E. JOSEPH THOMPSON MEMORIAL TROPHY.—This baseball trophy is given by Thomas Thompson in memory of his brother E. Joseph Thompson who graduated from Massachusetts State College in 1932. He was president of the Student Senate, a varsity letter man in football and baseball, and an outstanding campus citizen. The award goes to that member of the varsity baseball team who best exemplifies the best characteristics of the sport each year.

ACADEMICS CONSPICUOUS SERVICE TROPHY.—This trophy is awarded annually to that student who has made the most unique contribution to the Academic Activities during the year.

ACADEMIC MANAGER'S PRIZE.—Fifty dollars awarded annually to that Academics manager who fulfills his routine duties most efficiently.

MILITARY HONORS AND AWARDS

Competed for yearly and presented at the Final Military Review.

SENIOR CLASS

DESIGNATION OF DISTINGUISHED MILITARY GRADUATES.

THE SONS OF THE LOYAL LEGION TROPHY.—Awarded annually by the Massachusetts Chapter of the Sons of the Loyal Legion to the senior cadet ranking No. 1 for the year in Military Scholarship and Efficiency. Winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

JUNIOR CLASS

THE MASSACHUSETTS CHAPTER RESERVE OFFICERS ASSOCIATION TROPHY.—Awarded annually by the Massachusetts Chapter ROA and the Springfield Chapter ROA to the junior cadet ranking No. 1 in Military Scholarship and Efficiency. A plaque with winner's name engraved thereon is awarded by the Massachusetts Chapter ROA, and a sterling silver goblet, donated and presented by the Springfield Chapter ROA, is given to the individual to keep in his permanent possession.

THE AIR FORCE ASSOCIATION MEDAL.—Awarded by the Air Force Association to the outstanding Air ROTC cadet in the First Year Advanced Course. This award is based on academic and military scholarship grades and individual characteristics of leadership.

SOPHOMORE CLASS

THE ELIZABETH L. MCNAMARA TROPHY.—Awarded annually by Mrs. Elizabeth L. McNamara, a trustee of the University for many years, to the cadet ranking No. 1 in scholarship and military efficiency in the second year basic course. Award consists of a permanent plaque with winner's name inscribed thereon.

THE JOHN C. HALL TROPHY.—Awarded annually to the cadet ranking No. 1 in scholarship and military efficiency in the second year basic course. Award consists of a loving cup donated by the class of '02 with the winner's name inscribed thereon, and a sterling silver goblet awarded by Mr. John C. Hall is given to the individual to keep in his permanent possession.

FRESHMAN CLASS

THE AMHERST ROTARY CLUB TROPHY.—Awarded annually by the Amherst Rotary Club to the cadet ranking No. 1 in Scholarship and military efficiency in the first year basic course. Winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

OTHER AWARDS

THE MILITARY DEPARTMENT TROPHY.—Awarded annually to the cadet of any class who has been of the most value to the Cadet Corps during the past year. Award consists of a sterling silver goblet appropriately engraved, which is given to the individual to keep in his permanent possession.

THE BRIDGMAN TROPHY.—Awarded by Mr. E. F. Bridgman to the member of the Rifle Team with the highest average score for the season. Award consists of a sterling silver goblet appropriately engraved, which is given to the individual to keep in his permanent possession.

QUALIFICATION BADGES U.S. ARMY.—Awarded to cadets who have qualified with the necessary scores with either Rifle or Pistol.

ALUMNI ASSOCIATION

The Associate Alumni is the general organization of the Alumni, men and women, of the University of Massachusetts. The association maintains headquarters at Memorial Hall, erected by Alumni and friends in honor of those men of the University who died in World War I.

It publishes a monthly Bulletin as the alumni publication of the University and, periodically, an Alumni Directory.

The Associate Alumni strives to advance the interests and welfare of the University of Massachusetts in every way possible, and cooperates in its educational work.

The organization is presently engaged in extending the facilities of Memorial Hall, as a memorial to those men who died in World War II.

Under alumni sponsorship, eight self-liquidating dormitories are being built on campus.

The governing body of the Associate Alumni consists of its officers and a Board of Directors. Four directors are elected each year and serve a term of four years. All graduating seniors become members of, and contributors to, the Association at graduation according to a tradition set by the Class of 1940.

UNIVERSITY AT FORT DEVENS

The University of Massachusetts at Fort Devens provided instruction of collegiate grade to Massachusetts veterans. This addition to the University of Massachusetts was established by legislative action on June 14, 1946. On May 29, 1949, the final convocation was held.

The act provided that the Board of Trustees be increased by the "addition of nine trustees to be appointed by the Governor, with the advice and consent of the Council, from the presidents of colleges and universities within the Commonwealth."

This campus of the University operated on the accelerated three-semester basis and accepted students at the opening of each semester in September, February, June, and through September, 1948. It was open to all male veterans of Massachusetts who qualified academically and who were eligible under the G. I. Bill.

A total of 2865 veterans were enrolled for the first two years of their college training. The courses given were equivalent with those given at the Amherst campus.



DEVENS QUADRANGLE

Viewed across the former parade ground at Fort Devens are the four main dormitories—Worcester, Norfolk, Essex and Suffolk houses. These served as dormitories for most of the 2685 veterans who returned to the Army post to enroll in the University of Massachusetts at Fort Devens for the first two years of their college training. At extreme left is the Administration Building, and at extreme right is shown the Campus Theater. On May 29, 1949 this emergency addition to the University held its final Convocation exercises, and the last group of students were transferred to the permanent campus at Amherst.



OLD CHAPEL BUILDING AT AMHERST

ADMISSION TO THE UNDERGRADUATE COLLEGE

Those interested in applying for admission to the University of Massachusetts should write to the Registrar to obtain an application form. The first two pages of the application form are completed by the candidate himself. The second two are completed by high school or preparatory school authorities who mail the application form directly to the Registrar of the University. Because of the increasing interest in college level study and the consequent increase in the number of applications, candidates are advised to file their applications at least before March 1st of the year in which they plan to enter.

Preference is given to residents of Massachusetts but the University also admits students from other States. A few students from foreign nations are also admitted. Candidates for the freshman class are accepted only for the opening of the college year in September. Students enrolled in other colleges may apply for admission to the Summer Session, but admission to the Summer Session does not necessarily constitute regular admission and enrollment in the undergraduate program of the University.

The University admits young men and women to the freshman class chiefly on the basis of character and scholarship. The general record must indicate promise of success and ability to profit by the opportunities which the University has to offer. Due regard is given to special achievement in specified subject matter fields.

SUBJECT REQUIREMENTS FOR ADMISSION

The subjects of preparatory study required for admission call for the satisfactory completion of a four-year high school course or its equivalent and are stated in terms of units. A unit is the equivalent of at least four recitations a week for a school year. High school graduation alone is not sufficient. The applicant's record must indicate capacity for handling the quality of scholastic work which the University has established as its standard of achievement.

Sixteen units of secondary school work must be offered, selected according to the following requirements:

Algebra	1½
Plane Geometry	1
English	4
Foreign Language (2 years of 1 language)	2
U.S. History	1

The remaining units are elective and may be selected from the following subject matter:

- a. Mathematics
- b. Science
- c. Foreign Language
- d. History and Social Studies
- e. Free electives (not more than four units)

Free elective subjects are those not included in groups a-d, as for example: Music, Art, Drawing, Typewriting, Aeronautics, Agriculture, Home Economics, etc. Such free electives are allowed in order that the student who wishes may have some opportunity to elect among other high school offerings, while at the same time covering the fundamental requirements for college work.

Students planning to pursue an engineering curriculum should offer two years of Algebra, one of Plane Geometry, and one-half year each of Trigonometry and Solid Geometry. Chemistry and Physics are also advised. Those deficient in the Mathematics should plan to cover it during the summer prior to entrance or expect to take five years to complete the college course.

In high schools organizing agricultural club work under the supervision and rules of the Junior Extension Service of the University, one credit is granted for each full year of work approved by the State Leaders.

Candidates of exceptional ability and promise may be considered for admission even though all the prescribed courses were not included in their high school program.

METHODS OF ADMISSION

Plan A. Students applying from accredited schools and making the college recommendation grade of their school in accordance with the subject requirements listed above are considered certified for admission.

Superior graduates of Vocational Schools of Agriculture in Massachusetts and Vocational Agricultural Departments in Massachusetts High Schools may be accepted for the Degree of Bachelor of Vocational Agriculture provided:

- a. They are unqualifiedly recommended by the Vocational Division of the Department of Education as bona fide Vocational Graduates with superior ranks; and
- b. That they can present at least 16 units of certified entrance credits, approved as to quality and quantity by the State Department of Vocational Education.

Plan B. Students who are not fully certified will be required to take the Scholastic Aptitude Test of the College Entrance Examination Board. In some cases three Achievement Tests will be required also. The applicant will be

informed what tests are to be taken as soon as his application is received or at the time of his personal interview. Candidates will ordinarily take these examinations in the spring of their senior year. Application blanks and a bulletin of general information concerning the tests may be obtained from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey.

The University realizes that though almost all students will qualify under either Plan A or B, there will be a few promising candidates who, for one reason or another, are unable to meet fully the subject requirements for enrollment. Such applicants are requested to present their individual problems to the Registrar in order that the Admissions Committee may outline for them what must be done to qualify for enrollment.

ADMISSION TO ADVANCED STANDING

A limited number of students from approved colleges may be admitted on transfer to advanced standing. Since applicants for such admission usually exceed the number that can be accepted, they are placed on a competitive basis. Acceptance will thus depend upon recommendations and quality of record.

Candidates desiring to transfer to the University of Massachusetts from other institutions should write to the Registrar for a regular application form, inasmuch as a student applying for transfer must first of all be able to meet the entrance requirements of the University. Such candidates should also submit the following:

a. A letter outlining reasons for wishing to transfer and describing briefly the type of major work to be followed if accepted for admission.

b. An official transcript of entrance credits and college record to be sent by the Registrar of the College attending. This should be forwarded as soon as possible after the close of the semester preceding the one for which transfer is sought.

At the time he is notified that he can be accepted for admission the student will be given a tentative statement of the amount of transfer credit he will receive. This credit will be finally determined, however, after he has spent a year at the University and his scholarship has been thoroughly tested.

At least one consecutive year of work in residence is required of any transfer student desiring to be recommended for the Bachelor's degree.

SCHOOLS AND DIVISIONS OF INSTRUCTION

Resident instruction is organized on a school and divisional basis. In the undergraduate college there are seven schools and two divisions. The schools are: School of Liberal Arts, School of Science, School of Horticulture, School of Home Economics, School of Engineering, School of Agriculture, School of Business Administration.

The Divisions are Physical Education and Military Science.

This section of the catalogue presents the opportunities for study in these schools and divisions, and describes the curricula available in each. Brief descriptions are given of the major work offered in the several departments and the special curricula which cut across departmental lines. The adviser in charge of each major is indicated. This adviser will aid the student in planning his program of studies and give him more complete information in regard to the qualifications for and opportunities in his particular field. For a description of specific courses refer to the Directory of Courses.

REQUIREMENTS FOR GRADUATION

At the beginning of his freshman year each student selects a school or division in which he will carry his major work. One of the fundamental objectives of all programs, however, regardless of School, is a general cultural education which should be the mark of every college graduate. With this end in view all candidates for the B.S. or A.B. degree must take certain required courses: English 1, 2, 25, 26; Speech 3 and 4; Economics 25; Psychology 26; and twelve semester hours of science. In addition at least three hours must be elected from one of the following: History 5, 6, 59, 60, or Government 25.

The requirements in Physical Education must also be satisfied. All physically fit men students must take Military 1, 2, 25, and 26.

Since the work of the first two years is directed largely toward a broad, general education as a foundation for the more specialized training of juniors and seniors, it follows that the program of studies for all schools is fairly uniform up to the junior year. Because of this students can readily change from one curriculum to another or even from one school to another as both freshmen and sophomores.

Regardless of major, students who plan to teach should register early, in their freshman year if possible, with the Department of Education although their work there does not begin until junior year.

The minimum requirement for graduation is 60 junior-senior credits in addition to the satisfactory completion of the required and elective work of the first two years. Except upon special permission from the Scholarship Committee no junior or senior shall enroll for more than 17 or less than 14 credits each semester.

During the junior and senior years each student shall complete not less than 15 and not more than 30 credits in junior-senior courses in the department in which he is specializing.

A new administrative organization which will combine the School of Liberal Arts and the School of Science into a College of Liberal Arts and Sciences was approved by the trustees in January 1949. Until the details of this organization have been worked out the Schools will continue to function as at present.

SCHOOL OF LIBERAL ARTS

FRANK PRENTICE RAND, *Acting Dean*

The School of Liberal Arts comprises the departments of Education, English, German, Romance Languages, Economics and Government, History and Sociology, Psychology, and Fine Arts. It offers a broad liberal program of studies aimed at giving the student a general cultural education in addition to professional training in certain fields. It also offers required and elective courses for students in other schools.

Students who satisfy the Liberal Arts requirements of the freshman and sophomore years and who as juniors and seniors complete the requirements for specialization in one of the several departments of the School qualify for the A.B. degree. However, students specializing in the departments of Psychology and Education may qualify for the B.S. degree by electing fifteen junior-senior credits in the Physical and Biological sciences.

Those enrolled in this School are required to take fundamental courses in the humanities, mathematics, and the physical, biological, and social sciences in the first two years. As a junior each student selects a major from the following: Economics, Government, Education, Psychology, History, Sociology, English, French, Modern Languages, German, Fine Arts, and Philosophy.

CURRICULA IN LIBERAL ARTS

The courses for the first two years are largely prescribed. Each student therefore follows a fairly uniform program of studies until he begins his specialization.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Mathematics 7	3	Mathematics 8 or 10	3
Chemistry or Biology (Botany and Zoology)	3	Chemistry or Biology (Botany and Zoology)	3
Foreign Language	3	Foreign Language	3
History 5	3	History 6	3
Physical Education 7 (women)	2	Physical Education 8 (women)	2
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Hygiene (women)	1		

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	3	English 26, Survey of Lit.	3
Economics 25 or Psychology 26	3	Psychology 26 or Economics 25	3
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

One of the following Sciences each semester:

Bacteriology 31, 31A	4	Zoology 35	3
Botany 25	3	Botany 26	3
Chemistry 29	4	Chemistry 30	4
Chemistry 31	3	Chemistry 32	3
Geology 27	3	Geology 28	3
Mathematics 29	3	Mathematics 30	3
Physics 25	4	Physics 26	4
Zoology 25	3	Entomology 26	3

Two electives from the following each semester:

French 7, 29, or 31	3	French 8, 30, or 32	3
German 25	3	German 26	3
Government 25	3	Economics 26	3
History 31	3	Government 28	3
Spanish 1	3	Spanish 2	3
		History 32	3
		Psychology 28	3
		Sociology 28	3

¹ If Economics is taken in the first semester, Psychology will be elected in the second and vice versa.

JUNIOR-SENIOR CURRICULA IN LIBERAL ARTS

Major work is available in the following departments during the last two years.

ECONOMICS

The department offers curricula in both Economics and Government.

ECONOMICS

P. L. GAMBLE, *Adviser*

In Economics the aims are twofold: (1) to give the student an understanding of economic theory and of the application of economics to the organization of society; (2) to provide students with the elementary training necessary for further study of economic and business problems.

The department requires that all majors irrespective of the career desired take the following courses: Economics 73, 79, Finance 53, Accounting 25, and Agricultural Economics 79 or Mathematics 62. In addition, each student must select an additional 12 credit hours of work from the Economics curriculum. No major student is permitted to take more than 36 junior-senior credit hours of economics, agricultural economics and business administration courses. In choosing elective courses students are urged to select courses in the humanities and preferably some from the allied fields of history, philosophy, psychology, and sociology. Those intending to major in Economics should elect Economics 26 in the sophomore year.

For the majors in the Economics department, there are offered courses which may be combined to serve as preparation toward a number of different careers. Among others, possible careers in the following fields are open:

Banking and Finance	Public Utilities
Government Service	Social Security
International Trade	Statistics
Labor and Personnel Relations	Transportation and Communication

GOVERNMENT

W. A. MITCHELL, *Adviser*

The work in government aims to give the student an understanding of the principles of government and their application to the organization of society, and to provide him with elementary training necessary for positions in government service or further study on the graduate level. It thus may be considered either as pre-law or pre-professional work, in addition to its general cultural utility.

Majors in the field should elect Government 25 and 28 in their sophomore year. In the junior and senior years a minimum of eight additional courses in government is recommended; these may be elected from the following: Government 52, 61, 62, 63, 64, 65, 66, 67, 68, 93, 94, or History 53. In addition eight supporting courses in other social sciences are recommended; these may be chosen from the fields of history, economics, sociology, or psychology. The remaining junior-senior courses should be chosen from the fields of languages, literature, philosophy, art, or music.

EDUCATION

A. W. PURVIS, *Adviser*

The Department seeks to utilize the forces of the University to prepare teachers for secondary schools and through its graduate offering to prepare administrators and specialists in the various phases of public education. Its teacher-training program is based upon the assumption that secondary school teachers should have a broad liberal education, considerable

mastery of the subject or group of subjects to be taught, and professional courses which should lead to a knowledge of the pupils to be taught, familiarity with the problems to be met, and new meaning to the subjects of instruction.

In order to realize these aims, all students who contemplate teaching or other school work as a career should register early, in their freshman year if possible, with the Department of Education although their work there does not begin until the junior year. Admission to either a minor or a major in Education will be determined largely by a composite rating based on scholarship as determined by University grades and success in the beginning course in History of Education, on the percentile rank of standard placement tests, and on personality ratings by members of the staff.

Currently there are two avenues leading toward a career of teaching in the secondary schools. The student may (1) major in Education or (2) minor in Education and major in subject-matter field to be taught.

THE MAJOR IN EDUCATION. This opportunity is intended for those students who desire to teach in one or more fields and who are seeking (1) a more diversified program than is possible under a subject-matter major and (2) a much wider opportunity to do practice teaching. Normally the student in his four years will schedule approximately thirty hours in one subject field, eighteen in a second subject field and eighteen in Education. The remaining hours will be distributed among supporting courses and courses in general education. The student should register early, in the freshman year if possible, in the Department of Education and should apply for the major in Education at the end of the sophomore year. He should elect History of Education 51 in the first semester of the junior year and candidates will be chosen for the major during that semester.

The following general outlines are given as examples of how the major in Education would apply to various teaching programs.

TEACHING ENGLISH AND HISTORY

First and second years—satisfy requirements of the School of Liberal Arts; elect Government 25, History 31, 32.

Third and fourth years—Education 51, 52, 53, 83, 85, 88. English 18 hours, History 6 hours, general 18-21 hours.

TEACHING MATHEMATICS AND PHYSICS

First and second years—satisfy requirement of the School of Science; elect Mathematics 29, 30, Physics 25, 26.

Third and fourth years—Education 51, 52, 53, 83, 85, 88. Mathematics 12 hours, Physics 12 hours, general 18-21 hours.

TEACHING CHEMISTRY AND BIOLOGY

First and second years—satisfy requirements of the School of Science; elect Chemistry 29, 30, Mathematics 29, 30, Botany 25, 26.

Third and fourth years—Education 51, 52, 53, 83, 85, 88. Chemistry 15 hours, Botany, Zoology 12 hours, general 15-18 hours.

THE MINOR IN EDUCATION. Training programs for students who desire to teach and to major in any of the Arts and Sciences or in Agriculture, Home Economics, Physical Education, or Extension are as follows:

TEACHER-TRAINING IN THE ARTS AND SCIENCES. The student should register early in the Department of Education and should usually elect prerequisite course, History of Education 51, in the first semester of the junior year. If the student is then accepted for a minor in Education he will normally take Education 52 and 88 in the second semester of the junior year, Education 53 and 83 in the first semester of the senior year and Education 85 in the last semester of the senior year. Opportunity for a restricted amount of practice teaching is available under Education 85 if the student's schedule permits. (Tuesday and Thursday should be free for this work.) A selected few from this group may be chosen each year for the One-Semester Plan if it is offered.

TEACHER-TRAINING IN AGRICULTURE. (Professor Oliver, adviser.) By a cooperative agreement with the State Division of Vocational Education, persons otherwise qualified may prepare to teach Vocational Agriculture by the satisfactory completion of Education 72, 73, and 75. Education 52 is also recommended. To insure a desirable range of preparation, students who contemplate vocational teaching should consult (early in the freshman year if possible) Professor Oliver and the State Supervisor of Agricultural Teacher-Training. A vocational teacher-training certificate is awarded by the Vocational Division to those who fully qualify.

TEACHER-TRAINING IN HOME ECONOMICS. (Professor Piatt, adviser.) These students will major in Home Economics and elect Education 51, 53, and 83, Home Economics 81 and 83, Psychology 55. A selected few may be chosen each year for the One-Semester Plan.

TEACHER-TRAINING IN PHYSICAL EDUCATION. (Professor Gore, adviser.) These students will major in Physical Education and elect at least eighteen hours of the academic field to be taught. They should elect Education 51, 52, 85, and 88, Physical Education 54, Psychology 55.

TEACHER-TRAINING IN EXTENSION. (Mr. Dayton, adviser.) The student will major in some branch of Agriculture, Horticulture (see page 121) or Home Economics (see page 132) and should elect courses in economics, speech, and journalism. They should elect Education 61 and 66.

ENGLISH

F. P. RAND, *Adviser*

The department of English offers courses in English composition and literature and in speech. Students majoring in this department must conform to the institutional and school requirements for freshman and sophomore years, and in choosing sophomore electives should include two semesters of modern language and one semester of English history.

The courses in English are intended to enable students to express themselves effectively and to appreciate humanistic values and the ideals of English-speaking people throughout their history. They also offer an appropriate, and in some instances an adequate, classroom training for work in such fields as teaching, authorship and editing.

The student must earn 30 credits in elective courses in English. However, for six of these he may substitute elective courses in other languages or speech.

JOURNALISM

The journalism courses are designed to provide professional guidance for students interested in newspaper work or related fields. Such students are advised to compete for membership on the college newspaper while freshmen or sophomores, take the introductory course (Journalism 85) as juniors, and elect other courses in social science and literature. Selected seniors will be provided a limited amount of actual professional experience.

FINE ARTS

J. ROBERTSON, D. ALVIANI, *Advisers*

The department of fine arts is to a certain extent interdepartmental and interscholastic, including that work of various departments which is artistic in their contributed courses. For the present the aim of the department is to bring together art, music and other courses in self-expression until the growth of the work permits the development of several special departments. The work in art is basic in its approach to design, drawing and painting. The art appreciation courses are non-professional in scope but provide a better understanding of the arts, in history and quality. The courses in music furnish an understanding of the history and interpretation of music, provide basic professional theory and afford some opportunities for performance. In addition, the department has made arrangements with well-qualified private teachers to offer instruction, without course credit, in voice and instrumental music to individuals or class groups.

The student majoring in fine arts is required to elect not less than 28 nor more than 30 credits from among the courses listed below. At least 15 credits must be from Group

A or from Group B, and the student's adviser is assigned on this basis.

A	B	C
Music 25, 26	Art 33, 34	Home Ec. 31
Music 51, 52	Art 27, 28	Home Ec. 62
Music 61, 62	Art 31	Land Arch. 51
Music 75, 76	Art 75	Flori. 58
English 81	Land Arch. 83, 84	Phys. Ed. 61, 62, 81, 82
Speech 89	Art 77, 78	

GERMAN

A. N. JULIAN, *Adviser*

The courses in German are intended to give a practical knowledge of the language for the purpose of wider reading, research, and oral communication.

During the junior and senior years each student will complete not less than 24 and not more than 30 credits in the junior-senior German courses. Students planning to use the language professionally are also urged to supplement their courses here with a summer session at an approved school of German.

HISTORY AND SOCIOLOGY

HISTORY

T. C. CALDWELL, *Adviser*

The courses in History are intended to impart an understanding of the people of the world and their problems through an analysis of man's development in the past. A major in this field should provide the student with a broad cultural background and a basis for good citizenship. History may have special value for the following groups:

(1) Those who plan to teach History or the Social Studies.

(2) Those who plan careers in which considerable knowledge of history is desirable. These might be in fields such as Law, Government Service, Journalism, and Library Work.

Students who wish to major in this Department are expected to conform to the institutional and divisional requirements of the freshman and sophomore years, including History 5 and 6. In choosing sophomore electives they should include two semester courses in history.

In addition to the above courses, students are expected to take a minimum of 24 credits in the elective junior and senior courses. Government 25 should be elected in the junior year if not taken as a sophomore elective. History 59 and 60, American History, and History 91 and 92, Historical Bibliography are required.

SOCIOLOGY

J. H. KORSON, *Adviser*

The courses in Sociology are planned with two aims in view:

(1) To give the student an understanding of the factors which influence men in their activities and interests as members of society, and

(2) To prepare those students who are interested in teaching Social Studies at the high school level; or those students interested in careers with government agencies; or in careers as social workers with state or private agencies to gain the pre-professional courses necessary before embarking on such careers. Most agencies require some work on the graduate level before full-time employment is obtained, while others offer in-training opportunities to graduate majors in Sociology.

SOCIAL WORK

Students interested in pre-professional training in Social Work are advised to follow the curriculum in Sociology. The American Association of Schools of Social Work indicates that the pre-professional subjects most closely related to professional work in this field are economics, political science, psychology, and sociology. The Association recommends that prospective students of Social Work or Social Administration take not fewer than 12 semester hours in one of these subjects while taking less in others. It also recognizes the value of courses in biology, history, English as well as other subjects contributing to a broad cultural background for the student.

Students who expect to major in Sociology are advised to elect freshman Biology and Zoology 35. At least 24 junior-senior credits in Sociology are required. Students are required to take Sociology 53 and 82 and are urged also to select courses in economics, history, government, and psychology.

PHILOSOPHY

H. N. GLICK, *Adviser*

Philosophy in general attempts to offer a comprehensive understanding of the universe and makes an effort to decide what one should do while living in it. The distinctive purpose of the courses in philosophy is to concentrate on methods of inquiry, standards of thought, search for values in personal and community life, and the analysis of artistic expression and standards of criticism.

The student majoring in this subject will complete a minimum of 21 credits in junior-senior courses in philosophy. A wide range of supplementary courses is advised, among which the following are acceptable: Chemistry 88, Government 52, 66, Education 51, English 73, 75, 79, 80, Art 75, 77, 78, Music 51, 52, History 61, 63, 75, Mathematics 72, Psychology 61, 90, French 51, 52, Sociology 53, 82.

PSYCHOLOGY

C. C. NEET, *Adviser*

The courses in the psychology department are designed (1) to impart an understanding of behavior and the application of this knowledge to problems of human adjustment; and (2) to give preparation for professional work in psychology and related fields.

Careers open to psychology majors include: teaching and research, guidance, psychometrics, personnel and industrial work, child welfare, abnormal and clinical psychology, opinion polling, and government service. Additional training is required for certain of these careers.

Students planning to major in psychology should elect Psychology 26 and Psychology 28 in the sophomore year. In the junior and senior years majors are advised to take a minimum of 24 credits in Psychology. Courses 51 and 90 are required. As broad a cultural background as major programs will permit is advised.

Majors planning careers primarily in experimental and physiological psychology should plan to take one or more courses during their four years in chemistry, mathematics, physics, and zoology. Those planning careers in abnormal and clinical psychology and in child welfare, should elect specified courses in education, English, home economics, sociology, and zoology; while those planning careers in psychometrics, guidance, personnel and industrial work, and government service should take certain courses in business administration, in economics, education, industrial engineering, and sociology.

ROMANCE LANGUAGES

Two curricula are offered: French and Modern Languages.

FRENCH

C. F. FRAKER, S. C. GODING, *Advisers*

The courses in French are intended to give a rounded knowledge of the language for the purpose of wider reading, oral communication and research, leading to a better understanding of the art and the science of the nation. Students majoring in French are required to earn 30 junior-senior credits in the department. Those preparing to use the language professionally are usually urged to supplement their courses here with a summer in an approved school of language.

MODERN LANGUAGES

C. F. FRAKER, *Adviser*

A student who is primarily interested in language work but does not wish to subject himself to the restrictions of a specific major should elect Modern Languages. The requirements are these: 30 credits in elective courses in two or more of the modern languages, not including courses offered to fulfill the required 12 freshman-sophomore credits. However, for 6 of these credits a student may substitute elective courses in English or Latin.

SCHOOL OF SCIENCE

C. P. ALEXANDER, *Dean*

The School of Science includes the Departments of Bacteriology and Public Health, Botany, Chemistry and Chemical Engineering, Entomology, Zoology, Geology and Mineralogy, Mathematics, and Physics. The programs of study outlined by these departments lead to the degree of Bachelor of Science.

The School, through departments, provides professional and pre-professional training for those students planning to enter the fields of science. Courses in science required by, or of interest to, students enrolled in other divisions are also available.

Each department offers the usual requirements of undergraduate specialization in its particular field. These offerings enable the students to enter the fields of science and to continue to study for advanced degrees. In addition, special curricula are provided to meet the needs of special groups of students. These include curricula for pre-medical, pre-dental, and pre-veterinary students, and for those who plan to train as laboratory technicians and to enter Public Health Service.

The curricula in the School of Science are planned to provide a broad and cultural education, as well as opportunities for specialized training. To this end the work of the first two years is largely prescribed, specialization occurring in the junior and senior years. The concentration of the junior and senior years gives students as high a proficiency in their fields of specialization as is possible without sacrificing the objectives and requirements of a well-rounded education.

CURRICULA IN SCIENCE

FRESHMAN YEAR

Freshman work in the School of Science consists of definitely required subjects resulting in a fairly uniform program of studies for all students.

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
†Mathematics 7	3	†Mathematics 8 or 10	3
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Chemistry 1, General	3	Chemistry 2, General	3
†Biology (Botany 1 or Zoo. 1)	3	†Biology (Botany 1, or Zoo. 1)	3
German 1 or 5, or French 1, 5, 15	3	German 2 or 6, or French 2, 6, 16	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
Hygiene (women)	1		

† Chemical engineering majors take Mathematics 5 and 6, and substitute Mechanical Engineering 1 and 2 for Biology.

SOPHOMORE YEAR

In the sophomore year each student must take the required English, a Social Science, a Science, and two elective courses under the direction of his advisor.

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	3	English 26, Survey of Lit.	3
Economics 25 or Psychology 26	3	Economics 25 or Psychology 26	3
¹ Science	3	Science	3
² Electives	6	Electives	6
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

¹Elect one of the following:

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 31, 31A	4	Botany 26	3
Botany 25	3	Chemistry 30	4
Chemistry 29	4	Chemistry 32	3
Chemistry 31	3	Entomology 26	3
Geology 27	3	Geology 28	3
Mathematics 29,31	3	Mathematics 30, 32	3
Physics 25	4	Physics 26	4
Zoology 25	3	Bacteriology 31, 31A	4
Zoology 35	3	Zoology 35	3

² To consist of additional sciences selected from the above list, or a Science and a Language. Chemical engineering majors also take Civil Engineering 34. In selecting the required and elective courses in Science and Language, students should be guided by the recommendations for Sophomore work given under the description of Junior-Senior curricula that follows.

JUNIOR-SENIOR CURRICULA IN SCIENCE

Major work is provided in the following departments. In addition, there are other special curricula both pre-professional that cut across departmental lines. Students desiring complete information in regard to the opportunities and program of study in each curriculum are expected to consult the adviser in charge.

BACTERIOLOGY AND PUBLIC HEALTH

The Department offers three curricula: one in Bacteriology, one in Public Health, and the other in Medical Technology.

BACTERIOLOGY

L. A. BRADLEY, *Adviser*

The courses in Bacteriology have been planned to furnish (1) a general training in this field for college students; (2) specialization for those contemplating a professional career in Bacteriology.

Majors in Bacteriology should elect the following in the sophomore year: Chemistry 29, 30; Physics 25, 26; Bacteriology 31, 31A; Zoology 35. The Physics may be deferred until the junior year to allow for additional language study.

Juniors and seniors must take Chemistry 51, 52, and 79; and Botany 66 and Zoology 84 in addition to the required work in Bacteriology and Public Health.

PUBLIC HEALTH

L. A. BRADLEY, *Adviser*

Through the cooperation of several departments of the College and the Massachusetts Department of Public Health, curricula are provided for (1) a limited number of students interested in the many phases of public health service for which graduate work in medical or engineering schools is not essential; and (2) students planning graduate work in Sanitary Engineering.

Particular attention will be given to the training of sanitarians, district sanitary officers, food and milk inspectors, water and sewage treatment plant operators, technicians for public health laboratories, and agents for local boards of health. Students planning graduate work in Sanitary Engineering must also take Mathematics 29 and 30 (calculus) before the end of their junior year.

The following curriculum is required of all upperclassmen:

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 51, Advanced	3	Public Health 62, Sanitation	3
Public Health 61, Sanitation	3	Bacteriology 90, Sanitary	3
Chemistry 31 or 51, Organic	3-4	Chemistry 32 or 52, Organic	3-4
Electives	6	Electives	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agr. Econ. 79, Statistics	3	Public Health 86, Field Studies in Sanitation	3
Public Health 84, Administration	3	Public Health 88, Epidemiology Communicable Disease Control	3
Electives	9	Electives	10

ELECTIVES

During the Junior-Senior years, students elect a minimum of 24 semester credits from the following:

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
An. Hus. 53, Elements of Meat Packing	3	Bact. 82, Food	3
Chem. 63, Water and Sewage	3	Public Health 64, Planktology	3
Govt. 61, Public Administration	3	Bot. 66, Industrial Mycology	3
Mech. Engineering 1, Drawing	3	Dairy Ind. 52, Market Milk	4
Civil Engineering 77, Water Supply	3	Govt. 62, Public Administration	3
Food Tech. 75, Food Preservation	3	Civil Engin. 78, Sewerage	3
Forestry 51, Management of Water Sheds	3	Ent. 60, Pest Control	3
Geol. 27, Physical Geology	3	Ent. 74, Medical Ent.	3
Vet. Sci. 51, Animal Hygiene	3	Food Tech. 92, Food Analysis	3
Zool. 69, Parasitology	3	Home Ec. 52, Nutrition	3



EDNA SKINNER HALL



PHYSICAL EDUCATION BUILDING



POND ON UNIVERSITY'S DEMONSTRATION FOREST NEAR AMHERST



CHADBOURNE AND GREENOUGH DORMITORIES FOR MEN

CURRICULUM IN MEDICAL TECHNOLOGY

R. L. FRANCE, *Adviser*

This curriculum provides a broad fundamental training for young women who plan to qualify as medical technologists. The program more than meets the basic collegiate requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists.

Through an agreement between the Bingham-Rockefeller Laboratories and the University, each year a certain number of graduates of the course will be accepted as technicians in laboratories supervised by the Bingham-Rockefeller Foundation. There the technicians will receive further theoretical and practical training so that after a year they will be qualified to take the examination for the Certificate of Medical Technologist. A satisfactory living salary is paid the technician during the year of training and unusual opportunities for advancement are offered.

Also, through the cooperation of the Bingham-Rockefeller Laboratories, the University Placement Service, and the Department of Bacteriology and Public Health, graduates other than those accepted by the Bingham-Rockefeller foundation will be placed in laboratories certified by the American Society of Clinical Pathologists as qualified to train medical technologists.

Students taking this curriculum should complete the following sciences in the sophomore year: Bacteriology 31A; Chemistry 29, 30; and Zoology 35.

The junior-senior program follows:

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 51, Advanced	3	Bacteriology, 52, Advanced	3
Chemistry 31 or 51, Organic	3-4	Chemistry 32 or 52, Organic	3-4
Public Health 61, Sanitation	3	Public Health 62, Sanitation	
Zoology 51, Microtechnique	3	or Public Health 88, Communicable disease control	3
Electives	3	Electives*	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Bacteriology 81, Applied	3	Bacteriology 82, Applied	3
Bacteriology 85, Serology, Immunology	3	Bacteriology 92, Clinical	3
Zoology 69, Medical parasitology	3	Chemistry 80, Clinical	3
Electives	6	Electives*	6

* During the junior-senior years students elect 21 credits from the following:

History, required course
Chemistry 79, Physiological
Chemistry 82, Qualitative organic

Zoology
Physics 25, 26 Introductory
Liberal Arts

BOTANY

A. V. OSMUN, *Adviser*

The purpose of the courses in Botany is primarily to provide a thorough background for specialization in the science, and secondarily to support and supplement the work of other fields in which knowledge of plant life is held to be important. Certain courses should likewise prove of interest and value to the general student.

Those who wish to specialize in Botany will find here an ample field and an adequate opportunity for advanced undergraduate study. Post-graduate training, often with provision for financial aid, is available in most graduate institutions, and many teaching, research and industrial positions in schools, and colleges, experiment stations, federal and state services and private enterprise are open to the trained botanist.

The curriculum offers to the student an opportunity to acquire either a broad general knowledge of Botany, or to devote himself to more extensive study in one of the major divisions of the science, such as Plant Morphology and Taxonomy, Plant Physiology, Mycology and Plant Pathology. Under the direction of his adviser each student selects a program of courses in botany and other sciences, humanities and arts which seems best adapted to his particular botanical objectives.

Specialization in Botany assumes the satisfactory completion of certain basic and supporting courses prior to the junior year. These include Botany 1, 25 and 26; Chemistry 1, 2 and 29; and a Modern Language. Two years of German are advised.

The junior-senior program requires that courses in Botany to the amount of 15-30 credits be chosen under the guidance of the adviser. He will also make recommendations in regard to electives.

CHEMISTRY AND CHEMICAL ENGINEERING

CHEMISTRY

W. S. RITCHIE, *Adviser*

The objectives in Chemistry are to give the student an understanding of the subject which will enable him to appreciate the relation of Chemistry to other sciences, and to industry, and to provide training for those who intend to become teachers and workers in the allied sciences, and for those who wish to go on to graduate study and a professional career in Chemistry. Completion of the course in Chemistry fits the student for positions in the chemical industries and related fields as well as in the agricultural industry, for employment in state and Federal agricultural experiment stations and commercial laboratories and for teaching.

Students planning to major in Chemistry should elect German in the freshman year. The sophomore program should

include Chemistry 29, 30; Mathematics 29, 30; and Physics 25, 26.

Work for the junior and senior years includes required courses in Analytical, Organic, and Physical Chemistry and the possibility of election in related and supporting fields. While the major is arranged to provide general and fundamental training in the science, work in the humanities and social sciences is also recommended. The desirability and necessity of a well rounded education must not be overlooked.

CHEMICAL ENGINEERING

K. B. CASHIN, *Adviser*

The courses in chemical engineering are designed to give the student a good background and thorough understanding of chemical engineering principles. The student studies the fundamental principles first and then proceeds to apply them in the solution of comprehensive problems and in the use and operation of pilot plant sized equipment.

Students planning to major in chemical engineering should elect German in the freshman year. The sophomore program should include Chemistry 29, 30; Mathematics 31, 32; Physics 25, 26; and Civil Engineering 34.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Chemistry 65, Physical	4	Chemistry 66, Physical	4
Chem. Engin. 57, Inorg. Tech.	3	Chem. Engin. 60, Heat-Energy	3
Chem. Engin. 55, Calculations	3	Chem. Engin. 56, Unit	
Civil Engin. 53, Strength	3	Operations I	3
		Professional elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Chem. Engin. 93, Comp. Prob.	3	Chem. Engin. 76, Abstracts	2
Chem. Engin. 97, Unit		Chem. Engin. 94, Comp.	
Ops. II	3	Prob. II	4
Elec. Engin. 63, Elements	3	Chem. Engin. 98, Adv. Unit	
Professional electives	5	Ops.	2
History	3	Elec. Engin. 74, Electronics	3
		Professional elective	3-4
		Economics 25 or Psychology	
		26	3

ENTOMOLOGY

C. P. ALEXANDER, *Adviser*

Courses in Entomology serve two purposes: (1) to give students a general knowledge of insects, particularly in their relations to man, his crops, his domestic animals, and his health; (2) to train students desiring to specialize in Entomology to become United States, state, or experiment station entomologists, teachers, forest entomologists, tree wardens, or to occupy other position where an expert knowledge of insects is required.

The courses in Beekeeping are offered with the following aims: (1) to meet the increase in vocational opportunities

for the production of bees or honey as a business; (2) to study the beekeeping needs of fruit and truck-crop industries and the part that bees play in the pollination of flowers; (3) to acquaint the student with a recreational field that can be made profitable.

Majors are required to take Entomology 26 in the sophomore year. Strongly recommended sophomore subjects include Botany 25, 26; Zoology 25; Chemistry 29, 30; Zoology 35; and either French or German, or both.

Juniors and seniors should support their work in Entomology with the following courses: Botany 51, 64, 65; Bacteriology 61, 62; Chemistry 51, 52; Zoology 51, 69, 70; Pomology 56; English 84; and courses in Physics, Education, Floriculture, Horticulture and languages.

GEOLOGY AND MINERALOGY

L. R. WILSON, *Advisor*

The offerings in Geology and Mineralogy are intended chiefly for those who wish to gain some acquaintance with one or more branches of earth science. For the general student prerequisite requirements are reduced to a minimum. A program of moderate specialization may be provided for science majors who are interested in Geology.

To major in geology a student must complete thirty credit hours of work in the department. Those who have completed nine or more credits in geology in addition to the sophomore courses by the end of the junior year, and who wish to satisfy major requirements for graduation in the field of geology, will be given individual or group problems in the senior year. The nature of the work will depend upon student interest and preparation. In any junior or senior course in geology an additional period per week without credit may be required of students who specialize in this field. Chemistry through qualitative analysis and a year's work in college physics represent minimum requirements in these respective fields for undergraduate specialization in Physical Geology. For those interested in pursuing studies in stratigraphy or paleontology, work beyond the freshman year in the systematic aspects of both botany and zoology is essential for satisfactory progress.

MATHEMATICS

A. E. ANDERSEN, *Advisor*

The department offers courses designed to furnish a cultural background as well as a foundation for both undergraduate and graduate work in such fields of science as physics and chemistry, in engineering and in other technical subjects.

The courses recommended for majors in the department are designed to prepare students for high school teaching, graduate study in mathematics, actuarial work, statistical work, or work as Engineering Aides.

All majors are required to take Mathematics 29 and 30 and Physics 25 and 26 in the sophomore year. In the junior and senior years each major must take Mathematics 65, 91, and 92 and must, in addition, complete at least 15 credits in the following courses: Mathematics 51, 55, 60, 62, 66, 71, 72, and 94.

PHYSICS

W. F. POWERS, *Adviser*

The Physics courses give opportunity for the study of basic physical laws and phenomena of nature.

Emphasis is put on the applications of the principles studied. From these courses students may make a selection to satisfy a major in Physics, or to comply with requirements for graduate study.

Majors must take Physics 25, 26 and Mathematics 29, 30 in the sophomore year. They are also advised to elect Chemistry 31 and 32.

Juniors and seniors should plan to take all of the courses offered by the Department. These courses should be supported by additional work in mathematics and chemistry. As the interests of major students will vary, the Department members will be glad to make suggestions to individuals regarding their program of studies.

ZOOLOGY

G. L. WOODSIDE, *Adviser*

The courses in Zoology have two major aims: (1) to offer students an opportunity to develop an understanding and appreciation of the scientific method as a part of a liberal education; and (2) to provide training for prospective graduate students in Biology, Medicine, Dentistry, and related fields, as well as future teachers and laboratory technicians in the biological sciences.

The minimum requirements for majors are: Zoology 1, 35, 50, 53, 71, 72, and either 83 or 84; Chemistry 1, 2, 29, 30, 51, 52; Physics 25, 26.

SPECIAL CURRICULA IN SCIENCE

In addition to the major work provided in the Departments previously listed the following special curricula are available. For the most part these cut across departmental and even divisional lines. Students in these curricula follow the uniform science program for the freshman year and the recommendation in regard to sophomore electives indicated in each curriculum.

PRE-MEDICAL CURRICULUM

Advisory Committee: G. L. Woodside, Chairman, W. L. Machmer, G. W. Alderman, L. M. Bartlett, R. W. Fessenden, J. H. Smith.

Students planning to enter Medical, Dental or Veterinary Schools should register for this curriculum. Applicants for admission to such professional schools far exceed the number that can be accepted. Students should realize, therefore, that only well qualified, high ranking candidates may be admitted.

Although some professional schools do not require the Bachelor's degree for admission, it is highly desirable that a student plan to complete the work for the B.S. or A.B. For this the University requirement of a minimum of fifteen junior-senior credits in some one department must be met in conjunction with the curriculum outlined below.

During the first two years students in this curriculum follow the School of Science program as outlined on page 106. In the sophomore year they should elect the following: Chemistry 29, 30; Physics 25, 26; German 25, 26. In the senior year Chemistry 65, 66 (Physical) is highly recommended (prerequisites, Mathematics 29, 30).

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Zoology 65, Comp. Vert.		Zoology 66, Comp. Vert.	
Anatomy	3	Anatomy	3
History	3	Electives	9
Electives	6		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Zoology 75, Vert. Embryology	3	Zoology 76, Vert. Embryology	3
Electives	12	Zoology 84 Cellular	4
		Electives	9

The electives of the junior and senior years should include the requirements of the department in which the student wishes to major. Pre-medical students should elect as many courses in the School of Liberal Arts as possible, since Class A medical schools uniformly stress the importance of a broad general education.

CURRICULUM IN NURSING

L. A. BRADLEY, *Adviser*

The opportunity is available for women students completing two years of study to transfer to the Cornell School of Nursing and other accredited Schools of Nursing, and after three years to obtain both the degree of B.S. and R.N. Such students must include in their freshman and sophomore programs six hours of chemistry, six hours of biology, and three hours of psychology.

CURRICULUM IN RECREATIONAL LEADERSHIP

W. G. VINAL, *Adviser*

This curriculum is opened to a limited number of recommended students who seek training as leaders in the various recreational activities (physical, park, community, nature, camping, and the like).

The course of each student is planned to fit his personal aims and aptitudes. The freshman and sophomore requirements are those of the Division of Physical and Biological Sciences. The required upperclass courses are Bacteriology 61, Art 75; Biological Field Studies 51 and 52, 61 and 62 or Physical Education 73. A minimum of 15 semester hours in some one field related to that branch of Recreational Leadership chosen by the student is expected.

Because programs of study vary with the individual student, three types of curricula taken by former students, are given below:

PLAYGROUND LEADER IN URBAN AREAS

JUNIOR YEAR

German 25	Physical Educ. 53
Physics 25	German 26
Forestry 55	Forestry 56
Biol. Field Stu. 51	Biol. Field Stu. 52
Physical Educ. 55	Physical Edu. 72

SENIOR YEAR

Bacteriology 61	Entomology 26
Land Arch 51	English 64
Land Arch 79	Land Arch 52
Art 75	Bacteriology 62
Biol. Field Stu. 61	Biol. Field Stu. 62
Physical Educ. 71	Physical Educ. 52

RANGER NATURALIST IN METROPOLITAN AND NATIONAL PARKS

Military Science 51	Military Sci. 52	Military Sci. 75	Military Sci. 76
Sociology 51	Land Arch 52	Botany 81	Botany 84
Land Arch 51	Economics 25	Land Arch 75	Geology 62
Bacteriology 61	Astronomy 58	Botany 25	Physical Educ. 72
Forestry 55	Forestry 56	Speech 91	Biol. Field Stu. 62
Biol. Field Stu. 51	Biol. Field Stu. 52	Biol. Field Stu. 61	

COMMUNITY RECREATION

Sociology 51	Entomology 90	English 65	English 51
Education 51	Speech 89	Speech 91	English 68
French 29	French 30	French 71	Home Econ. 80
Bacteriology 61	English 46	Land Arch 75	Physical Ed. 82
Physical Ed. 61	Physical Ed. 62	Physical Ed. 81	Biol. Field Stu. 62
Biol. Field Stu. 51	Biol. Field Stu. 52	Biol. Field Stu. 61	Physics 58
Music 61			

SCHOOL OF AGRICULTURE

V. A. RICE, *Dean*

"Without food, nothing else matters." Perhaps partly for this reason at least, Agriculture is America's largest single industry. Not only is it large, but it is also extremely varied.

Over six million individual farms are now operated in the United States and many more will be needed for an "economy of abundance" in which all our citizens are to have, among other things, an adequate diet.

About one-quarter of a million scientists are now serving in Agriculture and its related fields, and more are needed if we are to increase our crop and animal production; conserve and improve our soil; control or eliminate plant and animal pests; improve the efficiency of our processing, storage, and distributing services; discover and apply new scientific and engineering principles to agricultural production and distribution, and new social and humanistic principles to rural living.

About eight million people make their living by providing necessary supplies to farmers and by moving our huge agricultural production to the consumer's table. Their tasks vary from supplying money, feeds, fertilizers, and a host of other necessities to farmers, to processing, storing and distributing the raw materials of farm production.

Agriculturally trained students find outlets for their training, ambition, and energies in the three principal fields suggested above, namely: (1) actual farm production either as farm owners or managers; (2) some scientific phase such as research on either a state, federal, or commercial basis; teaching at the secondary, collegiate, or extension level; or administration of state or federal production, conservation or financial programs; (3) the commercial phases of supplying farm machinery, electric power and equipment, seeds, feeds, fertilizers, insecticides, etc., or in processing, storing and marketing agricultural products of all sorts through either private or cooperative channels.

The work in the School of Agriculture is planned to provide a sound superstructure of applied science and technology reared on a firm and broad foundation of pure science and social humanistic studies. Upon graduation the student will have devoted about one-quarter of his time to pure science, one-quarter to social and humanistic studies, and one-half to applied science and technology in the various fields of Agriculture.

All students in the School must successfully complete one summer of placement training on a farm, in a dairy plant or in some business allied to Agriculture as stipulated by their major adviser. It is recommended that this graduation requirement be met during the summer immediately following the sophomore year of University residence.

During the spring of the senior year, they must also pass a comprehensive written examination set by the Department in which they are majoring; a comprehensive oral examination covering the whole field of Agriculture administered by a visiting board of agricultural leaders; and must present an oral paper on some personally chosen topic before another visiting board of agricultural leaders.

In order to prevent too narrow undergraduate specialization, no student will be allowed to offer for credit more than 16 junior-senior semester courses from the Schools of Agriculture and Horticulture. This means that at least 12 junior-senior credits must be earned in other departments, and at least 6 of these credits must be in the humanities or social sciences.

CURRICULA IN AGRICULTURE

The School of Agriculture comprises the following Departments: Agricultural Economics and Farm Management; Agronomy; Animal Husbandry; Dairy Industry; Poultry Husbandry; and Veterinary Science. Students may major in any one of these Departments (except Veterinary Science) during the junior and senior years, or may take the curriculum in General Agriculture. The engineering phases of Agricultural production and processing are handled in the School of Engineering.

UNIFORM FRESHMAN AND SOPHOMORE YEARS

All students majoring in Agriculture will take the following uniform curriculum during the first two years:

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
¹ Mathematics 7, Algebra and Trigonometry	3	Mathematics 8, or 10	3
Chemistry 1, General	3	Chemistry 2, General	3
Botany 1, General	3	Zoology 1, General	3
Animal Husbandry 1, Survey of Agriculture	3	Agronomy 2, Soils	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
		Hygiene (women)	1

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	3	English 26, Survey of Lit.	3
Economics 25, Elements	3	Psychology 26, General	3
² A Science		² A Science	3
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

Two of the following:

Dairy Industry 25	3
Poultry Husbandry 25	3
² A Science	3
² A Science	3

Two of the following:

Animal Husbandry 26	3
Agricultural Economics 26	3
² A Science	3
² A Science	3

¹ Students who are prepared and wish to take Calculus as sophomores should elect Mathematics 7 and 10. Candidates for the Bachelor of Vocational Agriculture degree take History in place of Mathematics.

² To be selected from the following:

	<i>Credits</i>		<i>Credits</i>
Bacteriology 31, 31A	4	Mathematics 29, 30	3
Botany 25, 26	3	Physics 25, 26	4
Chemistry 29, 30	4	Zoology 25, 35	3
Chemistry 31, 32	3	Entomology 26	3
Geology 27, 28	3		

JUNIOR-SENIOR CURRICULA IN AGRICULTURE

At the end of the sophomore year each student selects one of the following curricula as his major for the last two years.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

A. H. LINDSEY, *Adviser*

The purpose of the Agricultural Economics and Farm Management major is to train students for positions in those private and government institutions servicing the agricultural industry and to assist in the training of farm managers.

The department maintains an inventory of current price information and agricultural production reports from which price study and analysis may be made. Statistical machines are also available for computation and analysis. The laboratories of the department must be found in business institutions and on farms in Massachusetts with which contact is maintained.

Two curricula are available.

AGRICULTURAL ECONOMICS

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ag. Ec. 55, Mark'g Farm Prod.	3	Ag. Ec. 56, Coop. in Agri.	3
Ag. Ec. 57, Agri. Credit	3	Agricultural Electives	6
Agricultural Electives	6	General Electives	6
General Electives	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Accounting 25	3	Agri. Ec. 76, Farm Mgt.	2
Agri. Ec. 79, El. Statis.	3	Agricultural Electives	3
Ag. Ec. 75, Farm Mgt.	3	General Electives	11
Agricultural Electives	3		
General Electives	3		

All Agricultural Economics majors must take the courses listed above. Specialization may be in one of the three following fields: (1) Animal Products, (2) Fruits and Vegetables, (3) Feeds and Fertilizers.

The following courses must be completed for each of these specialized fields:

<i>Animal Products</i>	<i>Fruits and Vegetables</i>	<i>Feeds and Fertilizer</i>
An. Husb. 53	Pomology 53	Agronomy 51
An. Husb. 73	Pomology 77	Agronomy 52
Dairy 52	Olericulture 74	Agronomy 78
Dairy 77	Olericulture 78	An. Husb. 51
Dairy 78	Food Technology 51	An. Husb. 78
Poultry 75	Food Technology 52	Poultry 51

FARM MANAGEMENT

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agri. Ec. 55, Mktg. Farm Prod.	3	Agri. Ec. 56, Coop. Agri.	3
Agri. Ec. 57, Agri. Cr.	3	Agronomy 52, Soil Util.	3
An. Husb. 51, Nutrition	3	Agri. Ec. 78, Land Econ.	3
Electives	6	Bus. Law 70	3
		Electives	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agri. Ec. 71, Theory	3	Agri. Ec. 76, Farm Mgt.	2
Ag. Ec. 75, Farm Mgt.	3	An. Husb. 78, Dairy Cattle Prod.	4
Agronomy 51, Field Crops	3	Poultry 78, Management	2
Forestry 55, Mgt. Woodlands	3	Electives	8
Electives	3		

AGRONOMY

DALE H. SIELING, *Adviser*

The department of agronomy is equipped with modern soils, crops and chemical laboratories, greenhouses, and utilizes parts of the university farm for fertilizer and plant growth experimentation, and for demonstration of soil utilization and conservation.

The courses are designed to give instruction concerning the basic knowledge of the soil and its management, fertilizers, and their uses as related to the principal products of the field. Crop improvement practices and the science of crop improvement are stressed for those who are interested in agronomy as a specialty.

There is sufficient flexibility within the curriculum to allow the student to specialize in soil science, plant science, soil conservation or general agronomy. Those students who have a desire to receive training which will qualify them for investigational work in these fields may obtain it by selecting appropriate supporting science or vocational subjects as electives. This training equips them to serve as specialists in one of these selected fields for industrial corporations and may serve also as training for extension or teaching work.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agron. 57, Soil Formation	3	Agron. 52, Soil Utilization	3
Zoology 53, Genetics	3	Electives	9
Electives	6		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Agron. 51, Field Crops	3	Agron. 78, Fertilizers and Soil Fertility	3
Chem. 51, Organic	4	Chem. 52, Organic	4
Electives	9	Electives	9

ANIMAL HUSBANDRY

V. A. RICE, *Adviser*

In the University barns are maintained Percheron horses; Aberdeen-Angus, Ayrshire, Guernsey, Hereford, Jersey, Holstein and Milking Shorthorn cattle; Shroshire and Southdown sheep; and Chester White swine. The university farm is operated as a livestock farm producing all its necessary roughage in the form of pastures, hay and silage and a portion of its required grain.

The broad purpose of the Animal Husbandry major is that of providing the basic training for specialists in animal husbandry. Upon graduation, opportunities are available in the practical, scientific or commercial fields of animal husbandry; i.e., livestock farming, research, teaching, administration, or in the business phases of the livestock industry.

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
An. Husb. 51, Nutrition of Farm An.	3	An. Husb. 56, 56A, Beef and Sheep Production	4
An. Husb. 53, El. Meat Packing	3	Electives	
Electives			

SENIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
An. Husb. 75, An. Breeding	4	An. Husb. 76, Animal Breeding Practice	1
An. Husb. 81, Seminar	1	An. Husb. 78, Dairy Cattle Production	4
Electives		An. Husb. 82, Seminar	1
		Electives	

DAIRY INDUSTRY

D. J. HANKINSON, *Adviser*

Major students in Dairy Industry receive training in the testing, handling, and manufacture of milk, ice cream, butter, cheese, and other milk products. Practical application is made of chemistry, bacteriology, economics, and engineering in the many phases of dairy work.

The dairy industry department, with student Laboratories for the testing and manufacture of dairy products, research laboratories, and commercial scale milk and ice cream plant facilities, is housed in Flint Laboratory, a building devoted solely to dairy work.

Dairy industry graduates may secure responsible positions with commercial dairy manufacturing firms, or with equipment and supply firms. Opportunities are offered also for positions as teachers in high schools and colleges, for service in the fields of extension and research, and for sanitation and public health work with city, state or federal agencies.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Dairy Ind. 77, Butter and Cheese	4	Dairy Ind. 50, Judging	1
Chem. 51, Organic	4	Dairy Ind. 52, Mkt. Milk	4
Bact. 61, Public Health	3	Chem. 52, Organic	4
Electives	6	Electives	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Dairy Ind. 75, Chemistry	3	Engineering 80, Dairy Mech.	2
Dairy Ind. 79, Seminar	1	Dairy Ind. 78, Ice Cream	4
Bact. 81, Applied	3	Dairy Ind. 80, Seminar	1
Electives	9	Bact. 90, sanitary	3
		Electives	6

POULTRY HUSBANDRY

F. P. JEFFEREY, *Adviser*

The department gives instruction in the science, art and practices of poultry keeping, not only to students specializing in this department, but also to those in other departments who desire supporting work in poultry husbandry. The major courses prepare men for the successful operation of commercial poultry and breeding farms and hatcheries either as owners or managers; for high school, college and federal work in teaching, extension and research; and as service men, specialists and managers in industrial fields allied to the poultry industry.

Rhode Island Red, Barred Plymouth Rocks, White Plymouth Rocks, New Hampshires, and S. C. White Leghorns and several other breeds are maintained on a commercial basis at the poultry plant. There are modern buildings in which ventilation, breeding, feeding, incubation, brooding, marketing and managerial experimental projects are taking place, with up-to-date equipment.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Poultry Husb. 55, Housing and Sanitation	2	Poultry Husb. 52, Incubation and Brooding	3
Poultry Husb. 53, Judging	3	Poultry Husb. 56, Nutrition	3
Zoology 35	3	Electives	
Electives			

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Poultry Husb. 75, Market'g	2	Poultry Husb. 78, Seminar and Farm Management	3-4
Poultry Husb. 77, Breeding	3	Poultry Husb. 76, Turkey Prod.	2
Electives		Vet. Sci. 88, Avian Path.	3
		Electives	

CURRICULUM IN GENERAL AGRICULTURE

V. A. RICE, *Adviser*

If, instead of majoring in any single department a student wishes to spread his major more broadly over the field of agriculture, he may elect the following curriculum in General Agriculture:

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
An. Husb. 51, Nutrition of Farm Animals	3	Dairy Ind. 52, Market Milk	4
Agron. 51, Field Crops	3	Agron. 78, Fertilizers	3
Pomology 53, General	3	Olericulture 78, Commercial	3
Electives	6	Electives	6

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Agri. Ec. 75, Farm Organization and Mgt.	3	Agri. Ec. 76, Farm Or. and Mgt.	2
Vet. Sci. 51	3	An. Husb. 78, Dairy Cattle Prod.	4
Forestry 55, Mgt. of Woodlands	3	Poultry Husb. 78, Farm Organization	3
Electives	6	Electives	6

CURRICULUM IN AGRICULTURE AND HORTICULTURE
FOR EXTENSION WORKJAMES W. DAYTON, *Adviser*

There is an excellent opportunity in the Extension Service for a limited number of students interested in county agent and 4-H Club work. For a position in this field a student should have a general agricultural and horticultural education. Apprentice training between the junior and senior years is recommended.

FRESHMAN AND SOPHOMORE YEARS

For the first two years the student follows the curriculum in either the School of Agriculture or the School of Horticulture.

JUNIOR-SENIOR CURRICULUM

The student chooses a major in Agricultural Economics, Animal Husbandry, Pomology, Poultry, or Olericulture, taking 15 credits in the department in which he is specializing and the following courses: Economics 55, Education 61 and 66, English 81, Journalism 85 and 86, Psychology 55, Speech 91 and 92.

Electives should be chosen from the following, if not included in the freshman or sophomore year, or as a major:

Agriculture 1	Agricultural Engineering 72, 74
Agricultural Economics 26, 55, 76, 82	Entomology 26, 51, 80
Agronomy 51, 78	Forestry 55, 56
Animal Husbandry 26, 51, 75, 78, 91	Geology 27, 28
Bacteriology 31	History—3 credits
Botany 25, 51, 77, 78	Horticulture 1
Chemistry 31, 32	Olericulture 25, 51, 74, 78
Dairy 25	Physics 57
	Pomology 26, 51, 53, 56
	Veterinary 51

VETERINARY SCIENCE

Though major work in Veterinary Science is not available, the department does offer supporting courses to assist students who expect to enter the various fields of agriculture, public health, teaching and laboratory work in the biological sciences or veterinary medicine.

SCHOOL OF BUSINESS ADMINISTRATION

PHILIP L. GAMBLE, *Acting Dean*

The School of Business Administration is designed to prepare students for the numerous activities connected with the inception, operation and control of business enterprises without overlooking the need for a well-rounded education. Three specialized and one general curricula are offered to better prepare students for assuming the responsibilities of the adult citizen. Each of these curricula emphasizes general education in a common program for the first two years and reserves concentration on specialized programs for the last two years.

The differentiated and specialized curricula offered for the junior-senior years are in Accounting, Finance, Industrial Administration, and Marketing. These curricula are supplemented by a less specialized curriculum in General Business. Each course of study leads to the degree of Bachelor of Business Administration.

CURRICULA IN BUSINESS ADMINISTRATION

The courses for the first two years are largely prescribed. Each student therefore follows a nearly uniform program of studies until he begins his specialization. General education is emphasized by providing fundamental courses in the humanities, mathematics, science, and social science.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Government 25, American	3	History 6, Mod. European	
Mathematics 7	3	Civ.	3
English 1, Composition	2	Mathematics 8 or 10	3
Speech 3	1	English 2, Composition	2
Foreign Language or Economics 11, Econ. Geography	3	Speech 4	1
Elective, Science	3	Foreign Language or Economics 12, Ec. Hist. of U.S.	3
		Elective, Science	3

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Accounting 25, Principles of	3	Accounting 26, Principles of	3
Economics 25, Elements	3	Economics 26, Distribution	3
English 25, Survey of Eng. Lit.	3	English 26, Survey of Eng. Lit.	3
Psychology 26, General	3	Sociology 28, Elements	3
Elective	3	Elective	3

JUNIOR-SENIOR CURRICULA IN BUSINESS ADMINISTRATION

GENERAL BUSINESS

PHILIP L. GAMBLE, *Adviser*

This program is offered to meet the needs of those students whose interest is in general business rather than in some more specialized field. The program is designed to provide training in the social sciences, particularly economics,

as well as in the applied fields of business administration. This training should fit a man for initial employment in the training courses of large corporations or for work in small businesses and for further study in graduate school of a more specialized nature.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Credit	3	Business Law 70	3
Mktg. 53, Marketing & Mktg. Prob.	3	Ec. 56, Business Cycles	3
Ec. 79, Labor Problems	3	Ec. 76, Prin. of Transportation	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Ec. 80, Labor Legislation	3
Elective	3	Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 57, Corporation Finance	3	Ec. 70, Monopolies	3
Ec. 73, Modern Econ. Theory	3	Ec. 78, Public Finance	3
Ind. Adm. 83, Business Mgt.	3	Professional Elective*	3
Professional Elective*	3	Electives	6
Elective	3		

* Professional electives are to be chosen subject to the approval of the adviser.

ACCOUNTING

RICHARD M. COLWELL, *Adviser*

This curriculum is designed to train students to understand business operations from the viewpoint of income, costs, valuation, financial systems and policies and the interpretation and execution thereof. In addition to providing a general business background, this curriculum is the foundation for advanced training in accountancy and financial management. The special positions of accountancy for which students can qualify are: auditors, certified public accountants, comptrollers, cost analysts, credit analysts, income-tax consultants, industrial accountants, public accountants, private accountants, system designers, and teachers of accounting.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 51, Ec. of Bus. & Industry	3	Business Law 70	3
Ec. 53, Money, Banking & Credit	3	Acctg. 72, Advanced Acctg.	3
Mktg. 53, Marketing & Mktg. Prob.	3	English 84, Expository Writing	3
Acctg. 71, Advanced Acctg.	3	Electives	6
Ag. Ec. 79, Prin. & Methods of Statistics	3		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 57, Corporation Finance	3	Ec. 78, Public Finance	3
Ec. 73, Modern Ec. Theory	3	Ec. 82, Investments	3
Ind. Adm. 83, Business Mgt.	3	Acctg. 74, Acctg. Systems	3
Acct. 73, Cost Accounting	3	Acctg. 76, Auditing	3
Elective	3	Elective	3

FINANCE

MILO KIMBALL, *Adviser*

Courses in banking, finance and insurance are provided for students who expect to assume managerial responsibilities for financing a business or to work for banks, investment institutions, brokerage houses, insurance companies, and governmental agencies concerned with finance. The curriculum provides for study of our monetary and credit institutions, the principles and procedures of financial administration, the principles and practices of insurance, training for investment analysis and the formation of investment policies.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Fin. 53, Money, Banking & Crd.	3	Ec. 56, Business Cycles	3
Fin. 65, Corporation Finance	3	Ag. Ec. 79, Statistics	3
Ec. 79, Labor Problems	3	Bus. Law 70, Business Law	3
Mktg. 53, Principles of Mktg.	3	Professional Elective	3
Elective	3	Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 73, Modern Econ. Theory	3	Fin. 76, Insurance	3
Ind. Adm. 83, Business Mgt.	3	Fin. 78, Public Finance	3
Fin. 81, Problems of Bus. Fin.	3	Fin. 82, Investments	3
Electives	6	Electives	6

INDUSTRIAL ADMINISTRATION

SHERMAN HOAR, *Adviser*

Expanding American industry now offers to qualified students the opportunity to find satisfying careers in the various fields of industrial management, labor relations, or personnel management. The curriculum offered is designed to give the student specialized training in these fields and a detailed and comprehensive understanding of the problems of business enterprise.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Mktg. 53, Mktg., & Mktg. Prob.	3	Business Law 70	3
Ec. 79, Labor Problems	3	Acctg. 74, Acctg. Systems	3
Ind. Adm. 83, Business Mgt.	3	Ec. 80, Labor Legislation	3
Acctg. 73, Cost Accounting	3	Mktg. 52, Industrial Purchasing	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Mech. Engin. 28, Machine Shop	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Crdt.	3	Ec. 76, Prin. of Transportation	3
Ec. 57, Corporation Finance	3	Ind. Engin. 88, Time & Motion Study	3
Ec. 73, Modern Ec. Theory	3	Psych. 86, Industrial	3
Electives	6	Ind. Adm. 84, Personnel Adminis.	3
		Electives	3

MARKETING

HAROLD E. HARDY, *Adviser*

This program is designed to train students to understand the advertising, selling and related problems of wholesale and retail enterprises and industrial firms. The curriculum offers general training in economics and business principles along with specialized study of basic types of market operations.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 53, Money, Banking & Crdt.	3	Mktg. 54, Sales Mgt. & Salesmanship	3
Mktg. 53, Mktg. & Mktg. Prob.	3	Mktg. 52, Industrial Purchasing	3
Ec. 79, Labor Problems	3	Business Law 70	3
Ag. Ec. 79, Prin. & Methods of Statistics	3	Ec. 76, Prin. of Transportation	3
Elective	3	Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ec. 55, Ec. of Consumption	3	Mktg. 72, Market Research	3
Ec. 73, Modern Ec. Theory	3	Mktg. 74, New England Markets	3
Mktg. 71, Retail Merchandising	3	Psych. 86, Industrial Psych.	3
Mktg. 73, Advertising	3	Professional Elective*	3
Elective	3	Elective	3

* Professional elective is to be chosen subject to the approval of the adviser.

SCHOOL OF ENGINEERING

G. A. MARSTON, *Dean*

The departments of agricultural engineering, civil engineering, mechanical engineering and electrical engineering comprise the School of Engineering. Each department offers a curriculum leading to a Bachelor of Science Degree in that particular branch. An optional curriculum in industrial engineering is offered in the mechanical engineering department.

Engineering can be defined as the combination of science and art by which materials and power are made useful to mankind. An engineer requires intensive technical training but at the same time he should acquire the broad education that distinguishes the professional man from the technician. His education does not end with formal schooling but continues throughout his life as he accumulates experience.

The curricula in engineering have been carefully prepared to offer each student the opportunity to acquire a sound training in the fundamental work of the various branches of his chosen field. At the same time he receives a thorough training in the sciences and mathematics, which are the important tools of the engineer. About twenty per cent of his time is devoted to the social and humanistic studies. Some opportunity to pursue his particular interest is offered in the senior year.

The curriculum of the freshman year is the same for all. Specialization to a limited extent begins in the sophomore year.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Mathematics 5, Analytical		Mathematics 6, Diff. Calculus	4
Geom.	4	Physics 26, General	4
Physics 25; General	4	Mechanical Eng. 2 (Drawing)	2
Mechanical Engineering 1		Military 2	2
(Drawing)	2	Physical Ed. 4	1
Military 1	3		
Physical Ed. 3	1		
Elect one of the following:			
History 5	3	History 6	3
German 1, 5	3	German 2, 6	3
French 1, 5, 15	3	French 2, 6, 16	3
Spanish 1, 7	3	Spanish 2, 8	3

JUNIOR-SENIOR CURRICULA

Majors in Engineering will select one of the following curricula.

AGRICULTURAL ENGINEERING

H. N. STAPLETON, *Adviser*

Agricultural engineering is concerned with the application of scientific engineering principles to the agricultural industry in which mechanical and electrical power, processing equipment, design and development of a farm structure,

soil and water conservation, research, extension, teaching, and promotional activities form parts.

The curriculum is designed to prepare students soundly in basic sciences, engineering, and humanistic subjects for service in this expanding field. There is opportunity for limited specialization and generous provision for electives in the third and fourth years.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Eng. 25, Lit.	3	English 26, Lit.	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Civil Engin. 27, Surveying	2	Civil. Engin. 34, Applied	
Mech. Engin. 3, Descript.		Mech. (Statics)	3
Geom.	2	Civ. Engin. 26, Surveying	
Military 25	2	(Route)	3
Mech. Engin. 23, Shop	3	Military 26	2

SUMMER (6 WEEKS)

Civ. Engin. 28, Prop. & Topog. Surv.	3	Civ. Engin. 30, Route Surveying Prac.	3
(or approved industrial or farm employment)			

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Psych. 26 or Econ. 25	3	Econ. 25 or Psych. 26	3
Mech. Engin. 61, Test Materials	2	Agron. 2, Soils	3
Mech. Engin. 65, Heat Engin.	3	Mech. Engin. 68, Kinematics	3
Elect. Engin. 61, Principles of	4	Elect. Eng. 62, Prin. of Elec. Eng.	4
Civ. Engin. 51, Strength of Mat'l	4	Civ. Engin. 52, Applied Mech. (Kinetics)	3
Agricultural Elective	3	Agricultural Elective	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Ag. Engin. 71, Mech. Power	3	Ag. Eng. 76, Mech. Farm Equip.	3
Ag. Engin. 73, Farm Structures	4	Ag. Eng. 78, Drainage & Recl.	3
Civ. Engin. 75, Fluid Mechanics	3	Ag. Eng. 92, Seminar	1
Ag. Eng. 85, Farm Electrification	3	Ag. Ec. 76, Farm Org. & Mgt.	4
Mech. Engin. 83, Machine Design	3	Civ. Eng. 90, Contracts, Specif. & Est'g.	3
Tech. Elective	3	Tech. Elective	3

CIVIL ENGINEERING

M. P. WHITE, Adviser

The profession of civil engineering once included all engineering practice other than military. Even today it includes such branches as structures of all types, highways and railroads, hydraulics as it applies to river control and power development, irrigation and drainage, sanitary engineering including water supply and sewerage works, and the broad field of surveying and mapping. Civil engineers by the nature of their work find many opportunities for employment with governmental agencies. Those who go into construction must

go wherever their projects take them, while those engaged in design, maintenance and operation are generally located in cities or towns.

The curriculum in civil engineering is designed to prepare the student for work in any of these fields. At the same time he is required to devote about one-fifth of his hours to the humanistic-social courses.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Eng. 25, Lit.	3	English 26, Lit.	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Engin. 3, Descript.		Civ. Engin. 26, Route	
Geom.	2	Surveying	3
Civ. Engin. 25, Surveying	5	Civ. E. 34, Applied Mech.	
Military 25	2	(Statics)	3
		Military 26	2

SUMMER (6 WEEKS)

Civ. E. 28, Prop. & Topog.		Civ. Eng. 30, Route	
Surv.	3	Surveying Prac.	3

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Psych. 26 or Econ. 25	3	Econ. 25 or Psych. 26	3
Civ. Eng. 51, Strength of Mat'l.	4	Civ. Eng. 70, Theory of	
Civ. Eng. 55, Highway Engin.	3	Structures	4
Civil Eng. 61, Testing Mat'l.	2	Civ. E. 52, Applied Mech.	
Elec. Engin. 63, Elements of	3	(Kinetics)	3
Geol. 50, Engin. Geol.	3	Civ. Engin. 80, Soil Mechanics	3
		Mech. Engin. 59, Mat'l. of	
		Constr.	2
		Civ. Engin. 76, Fluid	
		Mechanics	4

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Civ. Eng. 71, Structural		Civ. Eng. 72, Adv. Struct.	
Design	3	Theory	3
Civ. Eng. 73, Concrete &		Civ. Eng. 78, Sanitary Engin.	3
Masonry	4	Civ. Eng. 90, Contracts,	
Civ. Eng. 77, Water Supply	4	Specif. & Est.	3
Civ. Eng. 81, Foundations	2	Civ. Eng. 92, Professional	
English 83, Technical Writing	2	Sem.	1
Non-Tech. Elective (Am.		Pub. Health 66, Community	
Gov't. 25 recommended)	3	Sanit.	2
		Technical Elective*	3
		Non-Tech. Elective (Bus.	
		Law 70 recommended)	3
		*Econ. 76, Prin. of Transporta-	
		tion	
		*Mech. Eng. 65, Heat Engin.	
		*Civ. Eng. 56, Transportation	
		Engin.	
		*Civ. Engin. 94, Advanced Sur-	
		veying	
		*Civ. Engin. 96, Hydraulic	
		Engin.	
		*Bact. 54, Fundamentals of	
		Water & Sewerage Bact.	

ELECTRICAL ENGINEERING

ROBERT R. BROWN, *Adviser*

Electrical engineering is that branch of the profession covering the engineering applications of electricity. The first commercial application was street lighting some sixty years ago. The electric lamp was followed in a few years by the electric motor, transformers, telegraph, telephone, radio, electronic devices, etc., so that today electrical engineering reaches into every profession, every walk of life. It has become so broad, so extensive in its applications, that it is considered to be divided into various fields such as power, communications, illumination, electronics, control engineering, and others, each of these having specialized sub-divisions.

The undergraduate curriculum is designed to prepare the student for work in any of these fields, and to serve as a basis for specialization in any of them, either in advanced courses or in the field. At the same time, about one-fifth of the student's work is devoted to the humanistic-social courses so that he may have an understanding of the broader aspects of engineering and its relation to other fields of human endeavor.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Lit.	3	English 26, Lit.	3
Math. 31, General Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Eng. 3, Descript. Geom.	2	Civ. E. 34, Ap. Mech. (Statics)	3
Econ. 25 or Psych. 26	3	Elec. Engin. 40, Fundamentals	3
Military 25	2	Military 26	2

SUMMER

Mech. Engin. 23, Shop	3 credits
Civ. Engin. 27, Surveying	2 credits

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Elec. Eng. 51, A.C. Circuits	4	Econ. 25, or Psych. 26	3
Elec. Eng. 53, D.C. Machinery	4	Elec. Eng. 54, A.C. Machinery	4
Elec. E. 57, Engin. Anly.	3	Elec. Eng. 74, Electronics	4
Mech. Eng. 65, Heat Engin.. I	3	Civ. Eng. 61, Testing of Mat'ls.	2
Civ. Eng. 53, Strength of Mat'l.	3	Mech. Eng. 66, Heat Engin.	3
English 83, Technical Writing	2	Civ. E. 52, Applied Mech. (Kinetics)	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Elec. Eng. 75, Applied Electronics	4	Elec. E. 78, Transient Analy.	3
Elec. Eng. 77, Elec. Network Anly.	3	Ind. Eng. 86, Industrial Engin.	3
Mech. Eng. 79, Mech. Eng. Eng. Lab. I	2	Elec. Eng. 92, Prof. Sem.	1
Civ. Eng. 75, Fluid Mechanics	3	Technical Elective*	7 or 8
Technical Elective*	4	Non-Technical Elective	3
Non-Technical Elective	3	*Elec. E. 80, Elec. Comm. II	
*Elec. Eng. 79, Elec. Communications I		*Elec. E. 86, Power Syst. Netw.	
*Elec. Eng. 81, Adv. Elec. Mach.		*Elec. Eng. 84, Ind. Electronics	
		*Elec. Eng. 88, Comm. Netw.	
		*Elec. Eng. 90, Illumination	
		*Elec. Eng. 94, U.H.F. Tech.	
		*Elec. Eng. 96, Electromagnetic Engr.	
		*Elec. Eng. 82, Power Applications in Ind.	

MECHANICAL ENGINEERING

MAURICE E. BATES, *Adviser*

Mechanical engineering is that branch of the profession which, broadly speaking, covers the fields of heat, power, design of machinery, industrial management and manufacturing problems.

Building upon the foundation laid by the departments of mathematics, physics, and chemistry, the department of mechanical engineering undertakes to show the student how fundamental physical laws apply to this field of the profession. The courses selected give the student thorough training in the basic principles so that particular applications can be mastered in professional practice. Therefore, no attempt is made to give highly specialized instruction.

It must be realized that the modern engineer lives in a time of rapid social and technological change. Only the man who has had a well-balanced cultural and technical program of study can adjust quickly enough to the needs of a continually changing social order. The following curricula emphasize the fundamentals of the four M's of engineering; materials, methods, men, and money, a knowledge of which is vital to the modern engineer.

SUMMER (FOLLOWING FRESHMAN YEAR)

Mechanical Engineering 27 and 28, Shop 6 credit hours

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Lit.	3	English 26, Lit.	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Chem. 1, General	3	Chem. 2, General	3
Mech. Eng. 3, Descript. Geom.	2	Civ. Eng. 34, Appld. Mech. (Statics)	3
Mech. Eng. 59, Mat'l. of Constr.	2	Mech. Eng. 72, Fund. of Metallurgy	3
Ind. Engin. 25, Prod. Processes	2	Military 26	2
Military 25	2		

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Econ. 25 or Psych. 26	3	Psych. 26 or Econ. 25	3
Civ. Engin. 52, Appld. Mech. (Kinetics)	3	Civ. Engin. 76, Fluid Mech.	4
Mech. E. 67, Mech. Instr. Lab.	1	Mech. Eng. 68, Kinematics	3
Mech. Eng. 63, Eng. Thermodynamics	4	Mech. Eng. 64, Eng. Thermodynamics	3
Elec. E. 61, Principles	4	Elec. Eng. 62, Principles	4
Civ. Eng 51, Strength of Mat'l.	4	Civ. Eng. 61, Testing of Mat'ls.	2

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Mech. Eng. 75, Power Plants	3	Mech. E. 76, Ref. & Air Cond.	3
Mech. E. 77, Internal Combust. E.	3	Mech. E. 80, Mech. Eng. Lab.	2
Mech. Eng. 79, Mech. Eng. Lab.	2	Mech. E. 86, Adv. Mach. Des.	3
Mech. Eng. 83, Machine Design	3	Technical Elect.†	6
Mech. Engin. 85, Dynamics of Mach.	3	Non-Tech. Elect. (Bus. Law 70 or Psych. 86, Ind. rec.)	3
Mech. Engin. 91, Sem.	1	†Mech. Engin. 82, Fluid Mach.	
Non-Technical Elect. (Am. Govt. 25 recommended)	3	Mech. Engin. 88, Steady-Flow Mach.	
		Mech. Eng. 90, Adv. Metallurgy	
		Elec. Eng. 65, Ind. Electricity	
		Ind. Engin. 86	

INDUSTRIAL ENGINEERING OPTION

W. H. WEAVER, *Adviser*

Industrial engineering is concerned with the engineering aspects of the organization, operation and management of manufacturing plants. It is based on the premise that the operation of a manufacturing plant is fundamentally an engineering activity. Consequently, the industrial engineering curriculum is built on a foundation of mechanical engineering. To the technical knowledge and scientific attitude developed through the study of engineering is added the study of certain courses in the humanities, in economics, and in management.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Econ. 25, or Psych. 26	3	Psych. 26 or Econ. 25	3
Mech. Eng. 65, Heat Engin.	3	Mech. Eng. 66, Heat Eng.	3
Civ. Eng. 53, Strength of Mat'l.	3	Civ. E. 52, Appld. Mech.	
Elec. Eng. 61, Prin. of Elec.		(Kinetics)	3
Eng.	4	Elec. Eng. 62, Prin. of E. E.	4
Acct. 25, Prin. of Bus.	3	Acct. 26, Prin. of Bus.	3
Ind. Engin. 51, Ind. Mgt.	3	Ec. 79, Labor Prob.	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Econ. 57, Corp. Finance	3	Ind. Adm. 84, Personnel	
Acctg. 73, Cost Acct.	3	Adm.	3
Mech. Engin. 79, Lab. I	2	Ind. Engin. 76, Time Study	3
Mech. Engin. 68, Kinematics	3	Ind. Engin. 78, Factory Pl.	2
Ind. Engin. 75, Job Evaluation	2	Ind. Engin. 80, Budget Con.	3
Ind. Engin. 77, Prod. Control	3	Ind. Engin. 82, Work Sim-	
Elective	2-3	plication	2
		Ind. Engin. 92, Sem.	1
		Elective	2-3

RECOMMENDED ELECTIVES

Psych. 86, Industrial	Soc. 28, Introduction
Ag. Econ. 79, Statistics	Govt. 25, American
Business Law 70	Mktg. 51, Sales Mgt.
Econ. 12, Ec. Hist. of U.S.	Elec. Engin. 65, Indus. Elec.
Econ. 80, Labor Legis.	English 83, Tech. Composition

SCHOOL OF HOME ECONOMICS

HELEN S. MITCHELL, *Dean*

Students majoring in Home Economics are fitted for a variety of professions as well as for successful home making in the broadest sense. The curricula provide for a general education including specialization in a chosen field of interest. Students with well-rounded personalities and some scientific inclination will find opportunities for intellectual growth and professional service in fields where well-trained women are in great demand. National professional organizations in this field set standards for which students may qualify in this program.

The four-year course in Home Economics includes a study of the physical, biological, and social sciences; English, history, and art; and opportunities for electives in other fields. In the spring of her freshman year, each student is assigned to a member of the Home Economics faculty who will serve as a friendly personal adviser and help the student decide upon her choice of electives in the subsequent years.

UNIFORM FRESHMAN AND SOPHOMORE YEARS

The program of studies for the first two years is largely prescribed with one sophomore elective to be chosen in line with the major interest.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Chemistry 1, General	3	Chemistry 2, General	3
Zoology 1, History 5, or Mathematics 7	3	Mathematics 12 or 8	3
Foreign Language	3	Foreign Language	3
Home Economics 1, Intro- duction	3	Home Ec. 2, Clothing Selec- tion and Constr.	3
Physical Education 7	2	Physical Education 8	2
		Hygiene	1

¹ Zoology 1 is especially recommended for those interested in Foods, Nutrition, or Child Development. History 5, Modern European Civilization, is a recommended alternative for those interested in art or design.

² Students who have had four years or more of two foreign languages in high school may substitute Zoology 1, History 5, or History 6.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	3	English 26, Survey of Lit.	3
Economics 25, Elements	3	Psychology 26, General	3
Chemistry 31, Organic	3	Chem. 32 or Zoology 35	3
Home Ec. 31, Applied Art	3	Home Ec. 30, Foods	3
Elective	3	Elective	3
Physical Education 27	2	Physical Education 28	2

³ Students may substitute Home Ec. 26, 61 or 62 for Course 31 and pre-research majors may omit.

Electives:

⁴ Accounting 25, Principles	3
Art 31, Elementary Design	3
⁵ Bacteriology 31, 31A	4
⁶ Chemistry 29, Qualitative	4
Government 25, American	3
⁸ Physics 25, Mechanics, Sound, Heat	4

Electives:

⁴ Accounting 26, Principles	3
⁴ Economics 26, Distribution	3
⁶ Chemistry 30, Quantitative	4
⁷ Home Ec. 26, Textiles	3
⁸ Physics 26, Light and Electricity	4
Sociology 28, Introduction	3
⁵ Zoology 35, Physiology	3

⁴ Recommended for merchandising majors.

⁵ Required for membership in American Dietetics Association.

⁶ Recommended in place of Chem. 31 and 32 for pre-research majors.

⁷ Recommended for Clothing and Textile and Merchandising majors.

⁸ Recommended for pre-research majors.

JUNIOR-SENIOR CURRICULA IN HOME ECONOMICS

A student may specialize in one of several fields of Home Economics during the junior and senior years. In consultation with her faculty adviser, each student will choose courses directly related to her objective. To qualify for a B.S. degree in Home Economics a student during the junior and senior years must have a minimum of 15 credits and not more than 42 credits in the School of Home Economics, 30 of which are in the major field. The following curricula are suggestive. Those interested in other types of professional work or commercial positions of any other type should consult with advisers about desirable electives. For students not interested in professional work, a more liberal choice of electives is possible.

CHILD DEVELOPMENT AND FAMILY LIFE EDUCATION. Students interested in child development, nursery school work and social service work should choose this curriculum including subjects marked (C). The University is affiliated with the Merrill-Palmer School in Detroit which specializes in education for home and family life. One or two outstanding students may be selected each year to study there for one semester of the senior year.

FOODS AND NUTRITION AND INSTITUTION MANAGEMENT. This curriculum prepares for the professional fields of hospital or administrative dietitian or nutritionist and meets the requirements of courses approved by the American Dietetics Association. This curriculum is also advised for those interested in home service and commercial demonstrating related to foods. Courses marked (N) should be included in this curriculum.

PRE-RESEARCH IN NUTRITION. This curriculum is planned for the students who wish to prepare for graduate work in nutrition or biochemical research. Some of the usual required courses usually required in home economics are waived in order to allow time for more of the basic sciences. The course should be planned with the advice of the Dean of the School and should include courses marked (PR).

HOME ECONOMICS EDUCATION AND EXTENSION. Preparation for teaching demands the same basic courses whether a student plans to teach adults or 4-H club groups in Extension, or young people at the high school or junior high school level. In addition to courses required of all home economics students, those marked (E) are recommended for those planning for any form of teaching. Courses in speech and writing are important. Electives should be chosen in line with special interests or needs. Teachers should be ready to teach some subject other than home economics if demanded; extension workers need special work in rural sociology and adult education. Camp teaching or apprentice training is recommended between junior and senior year.

MERCHANDISING AND RETAILING. This curriculum is planned in cooperation with the School of Business Administration and provides an opportunity for girls interested in preparing for the merchandising field. The junior and senior curriculum includes courses marked (M) in Home Economics and in Business Administration, and should be planned with the faculty adviser by the end of the freshman year if possible. Students choosing this program should plan on at least a year of in-service training after college.

TEXTILES, CLOTHING, AND RELATED ART. This curriculum is of interest to students who may wish to use clothing and related art in a general and aesthetic sense for their personal and family development. Students with ability and professional interest in the artistic and technical aspects of textiles, clothing, and related art are encouraged to go further in this field. Courses marked (T&C) should be included in this curriculum.

These curricula are planned to prepare students in several fields of interest. Courses required of all home economic students are indicated by an asterisk (*). Courses designed and recommended for special interests are indicated by letters as follows:

- (C) Child Development and Family Life.
- (N) Foods and Nutrition.
- (PR) Pre-research in Foods and Nutrition.
- (E) Home Economics Education and Extension.
- (M) Merchandising and Retailing.
- (T&C) Textiles, Clothing and Applied Art.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
*Home Ec. 51, Foods	3	*Home Ec. 52, Nutrition	3
*Home Ec. 75, Ec. of Household	3	Home Ec. 26, Textiles (E)	
Home Ec. 61, Clothing Selection & Const. (E) (M)		(M) (T&C)	3
(T&C)	3	Home Ec. 60, Equipment	
Ag. Engin. 51, House Planning (T&C)	3	(E) (M)	3
Chem. 51, Organic (PR)	4	Home Ec. 62, Home Furnish.	
Chem. 79, Biochem. (N)	4	(E) (M) (T&C)	3
Education (N) (E)	3	Home Ec. 70, Child Dev.	
		(C) (E)	3
		Chem. 52, Organic (PR)	4
		Education (E)	3

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Home Ec. 71, Retail Food Buying (N)	3	*Home Ec. 77, Home Mgt. (E)	3
#Home Ec. 81, Meth. of Teach. (E)	3	Home Ec. 80, Equipment (E)	3
Home Ec. 85, Nurserey Sch. Mgt. (C)	3	Home Ec. 83, Student Teaching (E)	3
Home Ec. 87, Tailor'g (M) (T&C)	3	Home Ec. 88, Appl. Dress Dsn. (M) (T&C)	3
Home Ec. 89, Diet Therapy (N) (PR)	3	Home Ec. 90, Nutr. Sem. (N) (PR)	1
Home Ec. 91, Inst. Mgt. (E) (N)	3	Home Ec. 92, Inst. Mgt. (N)	3
Home Ec. 93, Exp. Food (N)	3	Home Ec. 98, Special Problems (PR)	3
Home Ec. 95, Child Nutr. (N) (E)	3	Art 78, Renaissance & Modern (T&C)	3
Accounting 25 (N)	3	Speech 92 (E)	3
Art. 31, Elem. Design (M)	3		
Chem. 79, Biochem. (PR)	4		
Marketing 53, Mkt. Prob. (M)	3		
Speech 91 (E)	3		
Art 75, Appreciation (E) (T&C)	3		

* Required of all Home Economics Students.

Acceptable as credits in Education.

Other suggested electives for juniors and seniors:

Animal Husbandry 91, Genetics and Eugenics
Economics 26, 55
Education 51, 52, 53, 81, 88
English 81, Creative Writing
Food Technology 75
Marketing 53, 54, 72, 73

Government 25, American Journalism (English 85) (E)
Language
Literature
Music 51, 52
Psychology 55, 88, 94
Zoology 25
Sociology 52

SCHOOL OF HORTICULTURE

C. L. THAYER, *Acting Dean*

The School of Horticulture offers instruction in the growing and marketing of flowers, fruits, vegetables, and ornamental shrubs; in the breeding and improvement of plants; in the active management and conservation of forests and wildlife; in the design, planting and care of ornamental plantings, and in the processing and technology of food products.

In this broad field of horticulture trained leadership is needed as never before. On the land we must have more well-informed men with the vision to fit developments in their business into a rapidly changing national economy. In the research laboratory we must have more men and women fully competent and eager to push ahead of known procedures and blaze the way to a more effective horticulture geared to better living. In the classrooms of colleges and secondary schools we need more teachers who can orient their material to the economic and social development of the nation and can also bring to bear on current problems all that fundamental science has to contribute. Competent men and women are needed as never before to meet problems of great complexity which call for immediate solution.

FACILITIES FOR INSTRUCTION

The School has available the following facilities for instruction:

GREENHOUSES.—Splendid laboratories for propagating, growing, and studying a wide variety of flowers and vegetables are provided by nearly 20,000 square feet of greenhouse space adjacent to classrooms. The Durfee Plant Houses, in addition, contain a valuable collection of plants which illustrate chiefly the flora of tropical and subtropical regions. These are supplemented by about 5,000 square feet of hotbeds and coldframes.

GARDENS.—Several acres of land are used for the culture of vegetables in great variety, florists' crops, garden flowers, bedding plants, and herbaceous perennials. A nursery is maintained for instruction in the propagation of woody ornamental plants and an excellent collection of plants used in landscape work is available in gardens and campus plantings.

ORCHARDS.—Several hundred varieties of trees and small fruits are maintained in well equipped plantations near at hand. A fruit tree nursery offers the opportunity to become familiar with problems of propagation.

FORESTS.—The Mt. Toby forest of 755 acres and smaller tracts of woodland near the campus afford excellent facilities for field work in Forestry and Wildlife Management. A State Forest Nursery on the campus produces each year hundreds of thousands of seedlings of several species which are used for forest planting throughout the State.

LABORATORIES.—In addition to the facilities listed above a number of laboratories and drafting rooms are maintained by the departments of instruction. Of particular interest are the laboratories devoted to teaching and research in the manufacture, preservation, and examination of food products. Facilities are available for the use of small animals in nutritional work related to the technology of foods. The laboratory is equipped for food freezing and dehydration, and a modern cold storage warehouse is available for special studies.

CURRICULA IN HORTICULTURE

The School includes the Departments of Floriculture, Food Technology, Forestry and Wildlife Management, Landscape Architecture, Olericulture, and Pomology.

Each departmental curriculum is designed to give the student a thorough training in the Sciences and Arts involved most closely in the solution of problems in the field of that department and in the broader field of life in these times. Each curriculum provides a well considered foundation from which increasing effectiveness may be attained with further study and experience. Electives in the junior and senior years provide an opportunity for the pursuit of special interests or for the correction of deficiencies which might later be a handicap.

The program of studies for the first two years is fairly uniform for all curricula and is outlined as follows:

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Botany 1 or Zoology 1	3	Botany 1 or Zoology 1	3
¹ Chemistry 1, General	3	Chemistry 2, General	3
² Mathematics 7	3	Mathematics 8 or 10	3
³ Hort. 1, Plant Propagation	3	³ Agronomy 2, Soils	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2
		Hygiene (women)	1

¹ Majors in Landscape Architecture and Ornamental Horticulture may substitute a Foreign Language or History 5 and 6 for the year course in Chemistry.

² Students who expect to take Calculus in the sophomore year should elect Mathematics 7 and 10. Candidates for the Bachelor of Vocational Agriculture degree take History in place of Mathematics.

³ Food Technology majors will take Mechanical Engineering 1 (Drawing) in place of Horticulture 1. One year of modern language may be substituted for Drawing 1 and Agronomy 2 by special permission. Wildlife Management majors may take Mechanical Engineering 1 (Drawing) in place of Horticulture 1 or a year of modern language in place of Horticulture 1 and Agronomy 2.

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Survey of Lit.	3	English 26, Survey of Lit.	3
Economics 25 or Psychology 26	3	Psychology 26 or Economics 25	3
A Science Electives	6	A Science Electives	6
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2

In making all elections students should be guided by the departmental recommendations for the sophomore year to be found in the following description of junior-senior curricula in Horticulture.

JUNIOR-SENIOR CURRICULA IN HORTICULTURE

Juniors and seniors in Horticulture will elect their major work in one of the following curricula:

FLORICULTURE

C. L. THAYER, *Adviser*

The courses in Floriculture provide for a comprehensive and detailed study of the practices and principles involved in the production, marketing and uses of cut flowers, flowering and foliage plants grown outdoors and under glass. Opportunities available to graduates may include: positions in various fields of commercial floriculture, such as production, wholesale marketing and retailing; employment in nurseries, on private estates and in conservatories; positions in the professional field, including graduate study, teaching in colleges and secondary schools, research and extension work under state, Federal, or other supervision.

It is advantageous for the student to determine, as soon as possible, the type of position for which he wishes to fit himself since the choice of elective courses will depend largely on his decision.

As sophomores majors are advised to take Chemistry 29 and 30 for their Sciences. First semester electives should be Botany 25 and Olericulture 25; second semester Entomology 26 and Floriculture 26.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Flori. 51, Greenhouse Mgt.	3	Flori. 52, Flower Arrangement	3
Flori. 79, Conservatory Plants or	2	Flori. 54, Greenhouse Const.	3
Flori. 81, Herb. Gardens and borders	3	Plant Breeding 52, Methods	3
Zoology 53, Prin. of Genetics	3	Botany 51, Plant Pathology	3
Entomology 51, Pests of Special Crops	3	Electives	6
Electives	5-6		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Flori. 75, Commercial	3	Flori. 76, Commercial	3
Flori. 79 or	2	Flori. 82, Seminar	3
Flori. 81	3	Botany 68, Physiology	3
Botany 67, Physiology	3	Electives	8
Electives	8-9		

FOOD TECHNOLOGY

C. R. FELLERS, *Adviser*

The curriculum in Food Technology provides scientific and applied training in the principles concerned with the processing, preservation, and packaging of foods and food products. Both home and commercial methods of food preservation are considered. Practical work includes canning, freezing, dehydration, and fermentation and salting. Methods of manufacture of jams, jellies, fruit juices, and beverages are a part of course work. An effort is made to apply the student's background in chemistry and bacteriology to Food Technology problems and food analysis.

The curriculum gives the student a broad science background with specialized knowledge in food processing and preservation. Special courses are offered for Home Economics majors who plan to teach or do extension work in foods. Major fields open to graduates include: (1) commercial work in cannery, freezer and other plant operation; (2) control and analytical work related to food products; (3) government food inspection and grading; (4) technological work in government and industry.

Ambitious students are encouraged to acquire the background which will enable them to pursue graduate work and research in the application of scientific knowledge to the technology of foods.

The selection of supporting courses depends upon the objective of the student, which should be determined as early as possible.

Food Technology majors should take Physics 25 and 26 and Chemistry 29 and 30 in the sophomore year; also, if possible, Bacteriology 31 and 31A. Students planning to take Physical Chemistry should complete Mathematics 29 and 30.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Food Tech. 51, Introductory	3	Food Tech. 52, Food Prod.	3
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Bacteriology 51	3	Bacteriology 82, Applied	3
Electives		Agr. Engin. 80, Food Engin.	3
		Electives	

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Food Tech. 61, Industrial Technology	3	Food Tech. 62, Industrial Technology	3
Food Tech. 71, Food Science Literature	2	Food Tech. 72, Food Science Literature	2
Food Tech. 91, Exam. of Food Prod.	3	Food Tech. 92, Exam. of Food Prod.	3
Chemistry 79, Physiological or	4	Food Tech. 82, Confections and Cereal Products or	2
Chemistry 65, Physical Electives	3	Chemistry 66, Physical Electives	3

SUGGESTED JUNIOR-SENIOR ELECTIVES

Public Health 61, 62, 63	Poult. Husbandry 75
A foreign language	Olericulture 73, 74
Mechanical Engin. 1, 63	Botany 66
Pomology 77	Home Ec. 30, 52, 54
Dairy Ind. 75, 77, 52 or 78	Food Tech. 85, 95
Animal Husbandry 53	Chem. Engin. 55, 56, 58
	Indus. Engin. 25, 51

FORESTRY AND WILDLIFE MANAGEMENT

This department offers two curricula, one in Forestry and one in Wildlife Management.

FORESTRY

R. P. HOLDSWORTH, *Adviser*

The curriculum in forestry includes a series of courses in technical forestry sufficiently comprehensive to meet the requirements for general undergraduate preparation in this professional field. With its supporting and cognate courses it substantially meets the requirements for admission to the Junior Forester examination. Should the student upon receiving the Bachelor's Degree follow the highly desirable procedure of continuing his education at a graduate school of forestry, he should receive credit for a considerable proportion of the technical courses accomplished here. The additional time required to obtain the Master of Forestry Degree would normally be one year.

Should the student elect to pursue a pre-professional curriculum in forestry, giving less time to technical forestry courses and more to the basic sciences and cultural subjects, the time required to obtain the Master of Forestry Degree at a graduate school after graduation here will be two years.

Most of the forestry courses are open to students other than those concentrating in forestry, but these courses should be elected only after consultation with the student's major adviser, and the instructor teaching the course.

Sophomore majors in forestry take Economics 25 and either required History or Psychology 26 the first semester. Physics 25, Botany 25 and Civil Engineering 27 should be elected first semester; Botany 28, Physics 26, Forestry 26, and Entomology 26 second semester.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Forestry 53, Silvics	3	Forestry 56, Prin. of	
Forestry 55, Mensuration	3	Silviculture	3
Forestry 59, Protection	3	Forestry 54, Forest Soils	3
Geology 27, Physical	3	Forestry 66, Wood Anatomy	
Plant Pathology 51	3	& Indent.	3
		Wildlife Mgt. 72, Forest-	
		Animal Relationships	3
		Entomology 72, Forest Ent.	3

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Forestry 81, Regional Silvicult.	3	Forestry 82, Seeding and	
Forestry 57, Forest Policy		Planting	3
& Econ.	3	Forestry 80, Forest Mgt.	3
Forestry 75, Forest Products	3	Forestry 78, Harvesting	3
Electives*		Electives*	

* Two per semester are to be selected from the following:

Botany 67, 68	Accounting 25
Plant Breeding 51, 52	Language
Agronomy 57	History
English 81, 83	Psychology
Land Arch. 25	Chemistry
Geology 28, 51, 52	Mathematics
Agric. Econ. 79	

WILDLIFE MANAGEMENT

R. E. TRIPPENSEE, *Adviser*

The courses in wildlife management are designed both for those who desire a general understanding of the conservation of wild animals and for the professional student who expects to make his living in the wildlife field. Courses in wildlife conservation and management make excellent supporting work for students of public administration, economics, zoology, entomology, and forestry. Particular emphasis is given to wild animals on both forest and farm lands.

Students who expect to continue studies for advanced degrees are eligible for graduate work either in the Graduate School at the University of Massachusetts or in other institutions offering graduate work in this field.

Wildlife management is both an applied science and an art, and is concerned with the production and control of wild-animals crops on both wild and cultivated lands. In order to manage land, a knowledge of the origin and management of land is necessary. Thus, work in geology, soils, forestry, and agriculture is included in the training. Fields of specialization include fisheries management, game management, fur production, and control of injurious animals. Related fields include soil conservation, conservation education, and industrial biology.

Studies in wildlife management will be closely correlated with the work carried on by the State Department of Conservation and the U. S. Fish and Wildlife Service. During the junior and senior years trips will be planned to study the

work at the John C. Phillips Wildlife Laboratory at Upton and to attend the New England Game Conference at Boston. Numerous other wildlife projects will also be visited.

Sophomores should elect four courses from the following: Wildlife Management 27, Forestry 26, Bacteriology 31 and 31A, Zoology 35, Chemistry 29, Geology 27, Mathematics 29, Physics 25 and 26, Entomology 26.

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Wildlife Management 71	3	Wildlife Management 70	3
Forestry 55	3	Forestry 56	3
Electives*		Electives*	

SENIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Wildlife Management 75	3	Wildlife Management 74	3
Electives*		Electives*	

* Electives may include the following:

Civil Engineering 27	Botany 26, 81
Agron. 57	English 81, 84
Forestry 53, 80	Entomology 79
History	Accounting 25
Animal Husbandry 91	Agricultural Economics 79
Plant Breeding 51	Bacteriology 64
Chemistry 30, 51, 52	Vet. Science 88
Zoology 53, 65, 66, 75, 76,	Land. Arch. 25
80, 81, 83, 86, 87	Education
Language	Psychology
Government 25, 28, 61, 62	

LANDSCAPE ARCHITECTURE

R. H. Otto, Adviser

Instruction in this department has two objectives: first a contribution to general education; second a preparation of students for the professional practice of Landscape Architecture. The department offers optional curricula, (1) Professional Landscape Architecture, and (2) Ornamental Horticulture.

LANDSCAPE ARCHITECTURE

Students following this professional curriculum are prepared to take up work in Landscape Architecture, which leads through field experience or post-graduate study to permanent establishment in the profession.

Sophomores in the first semester elect either Botany 25 or Geology 27 for their Science and take Landscape Arch. 25 (Drawing) and Civil Engineering 27 as electives. In the second semester the Science is either Entomology 26 or Geology 28 and the electives Landscape Arch. 26 (Drafting) and Horticulture 26 (Plant Materials).

JUNIOR YEAR			
1st Semester	Credits	2nd Semester	Credits
Landscape Arch. 51, Topography	3	Landscape Arch. 52, Elements of Landscape Arch.	3
Landscape Arch. 53, Garden Design	3	Landscape Arch. 54, General Design	3
Hort. 51, Plant Materials	3	Hort. 52, Planting Design	3
Landscape Arch. 79, Construction & Maintenance	3	Electives	6
alternate with Art 83	3		
Elective	3		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Landscape Arch. 81, Advanced Design	3	Landscape Arch. 76, Civic Art 3	3
Art 75, Art Appreciation	3	Landscape Arch. 82, Advanced Design	3
Art 77, History of Art	3	Art 78, History of Art	3
Landscape Arch. 83, alternate with Landscape Arch. 79	3	Landscape Arch. 80, History and Lit. of Landscape Arch.	2
Elective	3	Electives	4

SUGGESTED ELECTIVES FOR JUNIOR AND SENIOR YEARS

Agronomy 53, 56, Agrostology	Agric. Engin. 51, House
Landscape Arch. 84, Sketching	Planning
Botany 67, 68, Plant Physiology	English 84, Library Research
Botany 81, Plant Ecology	Floriculture 81, Herbaceous Borders

ORNAMENTAL HORTICULTURE

The curriculum in Ornamental Horticulture is suggested for those preferring to follow the horticultural phase of Landscape including (1) nursery work; (2) planting; and (3) maintenance of landscaped areas, such as parks and semi-public institution grounds.

Sophomores in this major will take Botany 25, Civil Engineering 27, Landscape Arch. 25 in the first semester; Entomology 26, Floriculture 26, and Horticulture 26 in the second.

JUNIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Hort. 51, Plant Materials	3	Hort 52, Planting Design	3
Landscape Arch. 51, Topography	3	Landscape Arch. 52, Construction details	3
Agronomy 53, Turf Grasses	3	Pomology 26, Small Fruits	3
Landscape Arch. 79, Construction & Maintenance	3	Agronomy 56, Turf Mgt.	3
alternate with Botany 81	3	Elective	3
Elective	3		

SENIOR YEAR

1st Semester	Credits	2nd Semester	Credits
Flori 81, Herbaceous Borders	3	Entomology 72, Shade Tree	3
Landscape Arch. 53, Garden Design	3	Insects	3
Plant Breeding 51, Genetics	3	Pomology 56, Spraying	3
Forestry 55, Mgt. of Woodlands	3	Plant Breeding 52, Advanced	3
Botany 81, Plant Ecology	3	Botany 51, Plant Pathology	3
Alternate with Landscape Arch. 79		Elective	4

OLERICULTURE

G. B. SNYDER, Adviser

The courses in Olericulture offer a comprehensive training in the scientific principles and commercial practices related to the culture and marketing of vegetable crops. The studies and training involved are set up to prepare graduates to undertake work in the following fields: (1) practical work

in operating commercial market garden or truck farms or greenhouse establishments, (2) teaching Olericulture and related subjects in college, secondary or high schools, (3) extension work in Horticulture and Agriculture, (4) research studies with state, Federal, or private agencies, (5) state, Federal, or private inspection service agencies, and (6) the wholesale and retail marketing of vegetables and other perishable commodities.

The department of Olericulture has facilities in greenhouses, plant houses, hot beds, machinery and equipment used in production and marketing procedures as well as land to provide the student ample opportunity to become acquainted with modern techniques and practices used in handling vegetable crops. Nearby truck farms, wholesale and retail market outlets, variety trial plots of seed companies and inspection agencies are used to demonstrate laboratory and classroom points of discussion.

The rather broad objectives of the training mean that the selection of supporting courses depends upon the specific field in which the student wishes to engage on graduation. This objective should, therefore, be determined as early as possible during the sophomore year.

Majors in Olericulture should take the following courses during the first semester of the sophomore year: Chemistry 29, Botany 25, and Olericulture 25. In the second semester they should include Chemistry 30, Entomology 26, and Pomology 26.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Oleri. 51, Nutrient Requirements	3	Oleri. 52, Environment and Plant Culture	3
Plant Breeding 51, Genetics	3	Oleri. 54, Greenhouse Crops	3
Botany 51, Plant Pathology	3	Botany 68, Plant Physiology	3
Botany 67, Plant Physiology	3	Electives	6-8
Electives	5		

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Oleri. 73, Marketing Practices	3	Oleri. 74, Merchandising of Perishables	3
Oleri. 75, Systematic	3	Oleri. 78, Commercial	3
Oleri. 81, Seminar	1	Oleri. 82, Seminar	1
Entomology 51, Pests of Special Crops	3	Electives	10
Electives	7		

POMOLOGY

A. P. FRENCH, *Adviser*

The Pomology courses provide a comprehensive training in the scientific and commercial principles concerned in the growing and marketing of apples, pears, peaches, plums, cherries, and small fruits. Major fields open to graduates include: (1) practical work in connection with the operation of fruit farms; (2) teaching in college, high school, or secondary schools of agriculture; (3) extension work in

county, state, or nation; (4) research work with state, federal or private connections; and (5) commercial work in connection with the manufacture and sale of such supplies as machinery, packages, and spraying and dusting materials. Certain supporting courses are required and their selection depends upon the objective of the student. That objective should, therefore, be determined as early as possible.

First semester sophomores are advised to elect Botany 25, Physics 25, and Olericulture 25. In the second semester they should take Chemistry 29, Entomology 26, and Pomology 26.

The selection of junior-senior electives should be undertaken with the help of the departmental adviser. They will depend for the most part on the interests and objectives of the student and his class record to date. The student who wishes to do college teaching, extension work, or research is advised to secure a broad foundation in science and liberal arts, and to plan to enter a graduate school sooner or later. The student whose objective is growing fruit or teaching in secondary school may need to broaden his training in horticulture and agriculture and, again, will need all the science and liberal arts that can be included in the program.

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Pomology 53, General	3	Pomology 56, Spraying	3
Pomology 75, Systematic or	4	Botany 68, Physiology	3
Pomology 77, Commercial	3	Chemistry 32	3
Botany 51, Plant Pathology	3	Electives	
Botany 67, Physiology	3		
Chemistry 31			

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Pomology 81, Advanced	3	Pomology 82, Advanced	3
Pomology 75, Systematic or	4	Pomology 84, Seminar	1
Pomology 77, Commercial	3	Electives	
Pomology 83, Seminar	1		
Zoology 53, Genetics	3		
Electives			

DIVISION OF MILITARY SCIENCE AND TACTICS RESERVE OFFICERS' TRAINING CORPS

COLONEL WILLIAM N. TODD, JR., *P M S & T, Head*

Under act of Congress, July 2, 1862, the College was required to provide a two-year course in military instruction under a regular army officer. All able-bodied four-year male students are required by the University to take this course. Under act of Congress, June 3, 1916, as amended by act of Congress, September 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following World War I, under an act of Congress, July 19, 1918, the Reserve Officers' Training Corps was in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics. Beginning with the fall term, 1920-21, the infantry unit of the Reserve Officers' Training Corps was converted into a horse cavalry unit. The cavalry unit continued training until June, 1943, at which time the Advanced Course ROTC was discontinued for the duration of World War II. From September, 1943 through June, 1946 the Reserve Officers' Training Corps conducted courses in the basic course, branch immaterial only. In September, 1946, the Advanced Course ROTC was reinstated with an Armored Cavalry unit and an Air Corps unit.

The primary objective of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions and to produce junior officers who have the qualifications and attributes essential to their progressive and continued development as officers in the Army of the United States. It is intended to attain the objective during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers.

All male candidates for a degree in the four-year course, except veterans of World War II, must take the basic course of at least three hours a week of military training for two years. Veterans of World War II are not required to take the basic course, but are eligible to apply for the Advanced Course.

The courses for the freshman and sophomore years (basic course) will not be specialized by arm or service. The course of instruction includes theoretical and practical work in all phases of military science, such as military organization, hygiene and first aid, weapons, maps, military administration, military law and boards, and leadership, drill and exercise of command. Approximately forty per cent of the course is classroom and sixty per cent practical work.

Students who are approved by the president of the University and the professor of military science and tactics may elect to take the advanced course in their junior and senior

years and may enroll in either the armored cavalry unit or air corps unit. Advanced students will be commissioned in the organized reserve corps, in the respective branch, upon graduation. Honor graduates are offered a commission as 2nd Lieutenants in the Regular Army. Other graduates may elect to serve for two years extended active duty and by this means win a commission in the Regular Army.

The advanced course, in either branch, consists of at least five hours per week, and an advanced summer camp of about six weeks during the summer vacation between the two years of the advanced course. Students taking the advanced course are paid by the War Department at a rate equivalent to the value of the garrison ration which at the present time is 79c per day, or about \$24.00 per month. Advanced students are paid the pay of the 7th grade (private) while at summer camp.

All students are provided with a complete officers' uniform by the Army. A deposit of \$30.00 is required to cover cost of loss or damage to any articles issued.

DIVISION OF PHYSICAL EDUCATION

W. P. McGUIRK, *Head*

The Division of Physical Education includes the Departments of Athletics, Student Health, Physical Education for Men, and Physical Education for Women. It offers one major, that in Physical Education for Men.

INTERCOLLEGIATE ATHLETICS

W. P. McGUIRK, *Director*

The following men are in charge of the coaching of the intercollegiate teams:

Thomas W. Eck, Head Coach of Football, and in charge of Publicity; Lorin E. Ball, Assistant Coach of Football and Coach of Basketball; L. L. Derby, Coach of Track and Cross Country; L. E. Briggs, Coach of Soccer; Joseph R. Rogers, Jr., Coach of Swimming; Earl Lorden, Assistant Coach of Football and Coach of Baseball; Sidney W. Kauffman, Assistant Director of Athletics and in charge of Intramural Sports; Stanley F. Salwak, Coach of Tennis and Trainer.

STUDENT HEALTH

DR. E. J. RADCLIFFE, *Head*

Regulations in regard to Student Health are outlined on page 64.

All freshmen are required to attend a series of lectures on personal hygiene. For men, these lectures are included in the Military program; for women, they are designated as Hygiene, and taught by the Health Service staff.

PHYSICAL EDUCATION FOR MEN

H. M. GORE, *Adviser*

The work in the Department of Physical Education for Men includes required and elective physical fitness activity courses for all four years; and the opportunity to major the last two years in Physical Education; or to minor in Physical Education, Teacher-coaching or Physical Recreation.

The physical fitness activities courses for men, which are required the first two years and urged upon the upperclassmen are planned to help every man student to at least meet accepted reasonable minimum standards of physical fitness; and then, through regularity and continuity of progressively planned exercise, maintain good physical condition throughout his college career. Every freshman must pass a reasonable physical fitness rating and learn to swim.

The majors and minors in Physical Education are so planned as to qualify volunteer and professional leaders and instructors in Physical Education, Athletics, Health and Safety Education, and Physical Recreation for service and adult organization, organized summer camps, public service and industrial groups, schools and colleges.

The outline of the Physical Education Major follows. It is contemplated that Physical Education majors will be well trained in general scientific and cultural subjects as well as to be themselves physically fit. They are urged to elect advanced Military and courses in Education. Those planning on Teacher-Coaching should take additional work in their particular subject matter fields.

FRESHMAN YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Mathematics 7, Algebra and Trigonometry	3	Mathematics 8, Algebra	3
Physical Education 5, Survey	3	Physical Education 22, First Aid	3
Military 1	3	Military 2	2
Physical Education 3, Activity	1	Physical Education 4, Activity	1
<i>Elect two:</i>		<i>Elect two:</i>	
Chemistry 1, General	3	Chemistry 2, General	3
Botany 1, Introductory	3	Zoology 1, Introductory	3
History 5, Mod. European Civiliz.	3	History 6, Mod. Europ. Civiliz.	3

SOPHOMORE YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
English 25, Literature	3	English 26, Literature	3
Economics 25, Elements	3	Psychology 26, General	3
Physical Education 45, History	2	Physical Education 42, Aquatics and Water Safety	3
Physical Education 33, Activity	1	Military 26	2
Physical Education 43, Officiating	1	Electives (one to be a science)	6
Military 25	2	<i>Electives:</i>	
Electives (one to be a science)	6	Zoology 35	3
<i>Electives:</i>		Chemistry 32, Organic	3
Bacteriology 31, Introductory	2	Physics 26, Light, Electricity	4
Bacteriology 31A, Intro. Lab.	2	Language	3
Chemistry 29, Qualitative	4	History	3
Chemistry 31, Organic	3		
Physics 25, Mech., Sound, Heat	4		
Physical Ed. 57, Camping	3		
Language	3		
Government 25, American Govt.	3		

JUNIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Physical Ed. 53, Elem. Schools	3	Physical Ed. 54, Special Methods	3
Physical Education 51, Coaching	3	Physical Ed. 52, Coaching	3
Physical Education 63, Activity	1	Physical Ed. 76, Anatomy	3
Electives	9	Physical Ed. 64, Activity	1
		Electives	6

SENIOR YEAR

<i>1st Semester</i>	<i>Credits</i>	<i>2nd Semester</i>	<i>Credits</i>
Physical Ed. 71, Spec. Problems	3	Physical Ed. 56, Administration	3
Education 85, Prac. Teach.	3	Physical Ed. 78, Kinesiology	3
Physical Ed. 83, Activity	1	Physical Ed. 84, Activity	1
Electives	9	Electives	9

To comply with state certification requirements in education, Physical Education majors must take Education 52, Methods; Education 83, Secondary; Educational Psychology 55; and Education 85, Practice Teaching. It is recommended, for elective education courses, that Education 88, Curriculum, be first choice and if impossible to schedule it, that Education 53 Tests and Measurements be taken.

PHYSICAL EDUCATION FOR WOMEN

RUTH J. TOTMAN, *Adviser*

The courses in Physical Education for Women are planned to provide recreative activity, to develop body grace and efficiency, and to increase health and vigor. No major is available.

The first and second year women students are required to take Physical Education three times a week and are given two credits for each semester of satisfactory work. Third and fourth year students may elect Physical Education 61-62 or 81-82.

A physical examination is given before classes begin in the fall. Girls who are restricted from unlimited activity are placed in classes suitable to their ability. Girls who are restricted from all class activity are assigned to rest periods three times a week and receive their regular Physical Education credit for satisfactory attendance. A similar rest program is substituted for the regular activity program when girls are temporarily incapacitated.

DIRECTORY OF COURSES

This section contains a list of courses offered in the regular sessions of the University. Course descriptions are arranged alphabetically according to subject matter fields. If any course cannot be found readily, refer to the General Index in the back of the catalogue. A separate bulletin will outline those available during the summer. The University reserves the right to withdraw any course for which an insufficient number of students enroll.

Courses are designated by numbers as follows: freshman 1-24 inclusive; sophomore 25-49 inclusive; junior 50-74 inclusive; senior 75-99 inclusive. Odd numbers designate courses given in the first semester, even numbers those offered during the second. Credit is indicated in terms of semester hours. Where possible, the class schedule follows the course description. A complete schedule of class hours is published at the beginning of each semester.

Students are referred to the section on Divisions of Study and Curricula for a statement of graduation requirements and majors available.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

PROFESSOR LINDSEY, PROFESSOR BARRETT,
ASSISTANT PROFESSOR RUSSELL, MR. CALLAHAN

26. (II) ECONOMICS OF AGRICULTURAL PRODUCTION.—

This course considers the principles of production economics. An analysis of specialization, comparative advantage, diminishing, constant, and increasing costs and returns applied to the individual establishment as well as to the nation. A careful study of the combination of the factors of production is made considering the individual's adjustment when operating under monopolistic competition, laissez-faire, and monopoly. Finally, dynamic and static factors are considered in relation to their effects on the individual's production, on the economy of cities and nations, and on the international economy.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. BARRETT.

Prerequisite, Economics 25.

55. (I) MARKETING FARM PRODUCTS.—Not open to students who have taken or are taking Marketing 53. An analysis of present and past systems of assembling, transporting, distributing, and grading agricultural products. Such aspects as the adjustment of production and consumption, price formation, channels of distribution, price differentials and margins,

public policy, market reporting and forecasting, and a study of the marketing of major agriculture products are considered. Geographic, future, and quality differentials are studied from the agricultural and commercial standpoint. A field trip may be arranged.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

THE DEPARTMENT.

56. (II) THE FUNDAMENTALS OF COOPERATION.—A study of the philosophy and principles of cooperation in Europe and in the United States. The history of cooperation, legal consideration, management, financing, membership relations, methods of formation, sales methods and policies are given full attention. Progress in the cooperative marketing of different agricultural products is studied. One field trip required.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

MR. CALLAHAN.

57. (I) AGRICULTURAL CREDIT AND LAND APPRAISAL (1950-51).—A study of the development, use, functions, and operations of public and private credit institutions which are available to agriculture. Special emphasis is given to the practical aspects of credit policy and land appraisal. Given in alternate years.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

MR. LINDSEY.

71. (I) AGRICULTURAL ECONOMIC THEORY (1949-50).—The course is a comparative and critical study of the significant contributions of the leading economists to the theory of agricultural economics from the time of Adam Smith to the present. Given in alternate years.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

MR. LINDSEY.

75. (I) FARM ORGANIZATION AND MANAGEMENT.—This course analyzes the functions of the farmer as a business proprietor. Both the external and internal economic forces affecting the farm business are considered, such as selection and combination of factors of farm production, choice and combination of farm enterprises, the economical use of funds, the nature of farming costs, adjusting farm production to markets and prices, and the management of equipment and labor.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

MR. BARRETT.

Prerequisite, Agricultural Economics 26.

76. (II) ADVANCED FARM ORGANIZATION AND MANAGEMENT.—The use of farm records and accounts as a basis for planning and budgeting is emphasized. Measures of success

and factors in success in farming, and work simplification as applied to efficient farm techniques are considered. The last part of the course will be given over to the specific study of selected farms and the practical application of the principles and practices already discussed. Field trips are required at an estimated cost of not over five dollars.

1 class hour; 1 4-hour laboratory period.

Credit 2.

11:00-11:50 Th.; 1:00-4:50 M.

Mr. BARRETT.

Prerequisite, Agricultural Economics 75.

78. (II) PRINCIPLES AND PROBLEMS OF LAND ECONOMICS.

—A study of the major contributions by outstanding economic writers to theoretical land economics; a review of American land policies; a presentation of the principles, techniques, and objectives involved in modern land use planning; and a discussion of contemporary land problems in the United States.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. LINDSEY.

79. (I) and (II) PRINCIPLES AND METHODS OF STATISTICS.

—Methods of collecting, analyzing, interpreting, and presenting statistical data. Sampling principles, averages, dispersion, measures, index numbers, time series and simple correlation are specific fields covered. Practical problems in statistical analysis are given in the laboratory.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. LINDSEY, Mr. RUSSELL.

80. (I) and (II) ADVANCED STATISTICS.—This course is primarily devoted to linear and curvilinear multiple correlation analysis. Machine and shortcut graphic methods are used. Some time will also be devoted to probability and analysis of variance.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

1:00-1:50 W.; 1:00-2:50 M. F. Mr. LINDSEY, Mr. RUSSELL.

83. (I) ADVANCED FARM OPERATION.—For seniors specializing in agriculture; others by permission of instructor. A study of the efficiency of operations on a specific farm.

3 hours or equivalent.

Credit, 3.

Hours by arrangement.

Mr. BARRETT.

89. (I) 90. (II) PROBLEMS IN AGRICULTURAL ECONOMICS.

—This course may be conducted as a seminar or individuals may be assigned specific problems in price, credit or market analysis. It may also cover problems in land use and farm management.

Credit, 1-3.

Hours by arrangement.

THE DEPARTMENT.

AGRONOMY

Professor SIELING, Associate Professor DICKINSON, Assistant Professor THAYER, Assistant Professor EVERSON, Mr. ZAK, Mr. RUSSELL.

2. (II) SOILS.—This is an elementary course relating soils and their management to crop growth. This course is designed to give the student a broad background in soil science and its direct application to practical field problems. The course itself is presented with the object of introducing to the student the properties of soils and their influence upon the production of crops. The laboratory work consists of investigation of the fundamental characteristics of soil and basic principles of fertilizer and liming practices.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu. Th.; 3:00-4:50 W. or Th.

Mr. EVERSON, Mr. ZAK, Mr. RUSSELL.

51. (I) FIELD CROPS.—A study of the field crops of the United States which will include their uses and improvement, with their soil and climatic requirements. Emphasis will be given to the best farm practices of the northeastern states as to rotation, liming, fertilizing, seeding methods, tillage, disease and insect control, and to methods of harvesting and storage. As an individual problem, each student must make a detailed plan of crop production for the actual conditions of some New England farm.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 Th. Mr. THAYER.

52. (II) SOIL UTILIZATION.—The relationship of climate and native vegetation to the broader aspects of soil formation is described. Man's use of land resources is connected to show how the agricultural background of settlers have been active in soil use and abuse. Soil erosion control and its significance to permanent agriculture is considered.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. EVERSON.

57. (I) SOIL FORMATION.—The first part of this course considers those physical, chemical, biological, climatic and geological factors involved in soil formation. The relationship of these factors to the kinds of soils formed in the United States is discussed.

3 class hours. Credit, 3.
Mr. EVERSON.

77. (I) CROP IMPROVEMENT.—Theory and practice of the improvement of field crops by breeding and selection. 2 class hours; 1 2-hour laboratory period. Credit, 3.

Hours by arrangement. THE DEPARTMENT.
Prerequisites, Agronomy 51, Pomology 52, Zoology 53.

78. (II) FERTILIZERS AND SOIL FERTILITY.—The primary purpose of this course is to relate soils and fertilizers to plant growth. Studies are made of fertilizer practices in the United States and Europe. In the early part of the course consideration is given to the history of fertilizer development, with special emphasis upon early discoveries and causes of failure in early research. Later in the course, studies are made of factors which relate fertilizers and soils to plant growth. Fertilizer formulation technology and practice are considered in detail in the laboratory phase of this course. 2 class hours; 1 2-hour laboratory period. Credit, 3. 9:00-9:50 Tu. Th.; 1:00-2:50 Th. Mr. EVERSON.

79. (I) SOIL PHYSICS.—For seniors specializing in agronomy. The factors in soil which control tilth and energy relationships and the laws of physics which govern these factors are discussed. This includes heat, light, color, particle size and charge, water and gas movement, energy relationships and other physical factors effecting changes in the soil. The laboratory is used to familiarize the students with various methods used in measuring these important physical factors. 1 class hour; 2 2-hour laboratory periods. Credit, 3. Mr. EVERSON.

81. (I) 82. (II) SPECIAL PROBLEMS IN AGRONOMY.—For seniors specializing in agronomy. This course is designed to acquaint students with agronomic research methods and practical agronomic procedures. 3 2-hour laboratory periods. Credit, 3. Mr. SIELING.

Agrostology

53. (I) AGROSTOLOGY.—All factors that influence the successful growing of fine turf grasses are studied and correlated to enable the student to have a practical working knowledge of the construction and maintenance of lawns, sports, highway, airport and cemetery turf. 2 class hours; 1 2-hour laboratory period. Credit, 3. Mr. DICKINSON.

56. (II) AGROSTOLOGY.—This course considers fine turf management as a business and profession. Emphasis is placed on diagnosis and treatment of turf failures; the selection of equipment and supplies and client approach. Field trips and practical exercises are arranged. 1 class hour; 2 2-hour laboratory periods. Credit, 3. Mr. DICKINSON.

ANIMAL HUSBANDRY

Professor RICE, Associate Professor FOLEY, Assistant Professor COWAN, Assistant Professor HALE, Mr. SWANSON

1. (I) AGRICULTURE.—This course is designed to provide the student with a perspective of the whole field of agriculture

both in the old and the new world. The social interrelationships of agriculture, population trends, standards of living, rural health, recreation, etc., are considered as well as the functions of farmers' organizations. Finally, the manifold influences of political trends, tariffs, systems of taxation and the functions of rural institutions, such as the church, the school, the library, on the development of cultural intellectual patterns in rural living are discussed.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 M. or F. THE DEPARTMENT.

26. (II) BREEDS OF LIVESTOCK AND DAIRY CATTLE JUDGING.—This course considers the economic desirability of thirty breeds of domestic livestock. The origin, history, characteristics and distribution of the breeds of cattle, sheep, swine, and horses commercially important in the United States will be discussed. During April and May trips will be made on Saturdays to outstanding herds of dairy cattle in New England. The three highest ranking students in advanced judging will represent the College in the Intercollegiate Dairy Cattle Judging Contest at the Eastern States Exposition in Springfield, in September.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 Tu. Th.; 3:00-4:50 F., Feb. and Mar.; 8:00-12:00
S., Apr. and May. Mr. SWANSON.

51. (I) NUTRITION OF FARM ANIMALS.—This course will present the fundamental principles of animal nutrition together with the identification, composition, properties and uses of the common feed stuffs. The application of these basic principles in calculating balanced rations for all classes of livestock will be stressed, followed by practical feeding problems assigned outside the classroom. Feeding practices in use with the university livestock will be analyzed and demonstrated.

3 class hours; 1 2-hour laboratory period. Credit, 4.
8:00-8:50 M. W. F.; 3:00-4:50 W. Mr. SWANSON.

53. (I) ELEMENTS OF MEAT PACKING.—For department majors only. The lectures will discuss the development of the modern packing industry, the history of meat inspection, the principles of meat preservation and the opportunities in this field. Laboratories include the classification of cattle, calves, sheep, and swine into proper market classes and grades and slaughtering and dressing operations with animals provided by the university farm. Wholesale and retail cuts are prepared. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about ten dollars.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 or 3:00-4:50 M. F. Mr. HALE.

54. (II) MEAT PROCESSING.—For students not majoring in animal husbandry, by permission of the instructor. A few periods will be devoted to a discussion of the meat packing industry and to the preserving and care of meat products. The remainder will be spent on the classification of meat animals with practice slaughtering and the making of wholesale and retail cuts with stress on identification of retail cuts. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about ten dollars.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 Tu. Th.

Mr. SWANSON.

56. (II) BEEF AND SHEEP PRODUCTION.—This course considers the historical and economic development, present status and probable future trends of beef and sheep production in the United States, especially New England. Consideration will be given to types of production; systems and methods of feeding, management and marketing. In the laboratory, practice will be obtained in fitting and showing as well as certain practical techniques such as dehorning, ear-tagging, castrating, foot-trimming, shearing, etc., and the treatment and prevention of external and internal parasites as well as common ailments.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 3:00-4:50 M. or F.

Mr. COWAN.

56A. (II) GENERAL LIVESTOCK JUDGING AND FIELD TRIPS.—This course is given in conjunction with Animal Husbandry 56 and consists of practice in judging and selecting beef, cattle, sheep, horses, and swine. Throughout the spring, field trips are made to nearby livestock farms and breeding establishments. The five highest ranking students in judging will represent the university in the Intercollegiate Livestock Judging Contest at Eastern States Exposition the succeeding fall.

1 4-hour laboratory period.

Credit, 1.

8:00-12:00 S.

Mr. COWAN.

72. (II) MEAT JUDGING.—This course deals with the classification, grading and judging of carcasses and cuts of beef, veal, lamb and pork. Class work will be carried on at Amherst and nearby packing and distributing plants. The team to represent the university in the Intercollegiate Meat Judging Contest held in connection with the Eastern States Exposition will be chosen from students in this course.

1 4-hour laboratory period.

Credit, 1.

1:00-4:50 Tu.

Mr. HALE.

Prerequisites, Animal Husbandry 51 and 53 or permission of instructor.

74. (II) **ADVANCED MEATS.**—This course deals with the advanced techniques in preparing, preserving, and utilizing the various meat products from cattle, sheep and swine.

2 2-hour laboratory periods.

Credit, 2.

Mr. HALE.

Prerequisite, Animal Husbandry 53 or 54 and permission of instructor.

75. (I) **ANIMAL BREEDING.**—This course is planned to acquaint the student with the facts of reproductive physiology, with the facts and theories of modern genetics, and to show how such knowledge may be utilized through genetic analysis, selection, and systems of breeding for the creation of more beautiful and more efficient animal types.

3 2-hour periods.

Credit, 4.

1:00-2:50 M. W. F.

Mr. RICE.

Prerequisite, Zoology 53.

76. (II) **ANIMAL BREEDING TECHNIQUES.**—This course deals with the practical application of the principles of physiology of reproduction and selection to the improvement of farm animals. It includes practice in semen collection and evaluation, artificial insemination procedures and techniques, and in the study of genitalia at different stages of estrus and gestation periods in live and dead animals. Methods of easing and aiding parturition will be discussed and observed.

1 2-hour laboratory period.

Credit, 1.

3:00-4:50 Tu. or Th.

Mr. COWAN.

78. (II) **DAIRY CATTLE PRODUCTION.**—This is an intensive course covering all phases of dairy cattle and milk production. It affords an opportunity to seek the solution to the economic, nutritional, genetic, and managerial problems concerned in successful dairying.

4 2-hour laboratory periods.

Credit, 4.

8:00-9:50 Tu. Th.; 1:00-2:50 W., and Tu. or Th. Mr. FOLEY.

79. (I) **HORSE AND SWINE PRODUCTION.**—This course is the same as Animal Husbandry 56 except that it deals with horses and swine instead of beef and sheep.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 3:00-4:50 M. or F.

Mr. COWAN.

79A. (I) **ADVANCED LIVESTOCK JUDGING.**—This course is devoted entirely to beef, sheep, horse, and swine judging and selection. Field trips will be made to breeding establishments and a team will be selected to represent the University at the Intercollegiate Livestock Judging Contest at the International Livestock Exposition in Chicago and at any other

contests in which the University may occasionally or regularly participate.

1 4-hour laboratory period, first half of semester. Credit, 1.
8:00-12:00 S. Mr. COWAN.

Prerequisite, Animal Husbandry 56A or permission of instructor.

81. (I) SEMINAR.—For Animal Husbandry majors.

1 2-hour laboratory period. Credit, 1.
3:00-4:50 W. or Th. Mr. FOLEY.

82. (I) SEMINAR.—For Animal Husbandry majors.

1 2-hour laboratory period. Credit, 1.
3:00-4:50 Tu. or Th. Mr. RICE.

83. (I) ADVANCED MEAT JUDGING.—This course is a continuation of Course 72. The team to represent the University in the Intercollegiate Meats Judging Contest held in connection with the International Livestock Exposition will be chosen from students in this course.

1 4-hour laboratory period, first half of semester. Credit, 1.
1:00-4:50 Tu. Mr. HALE.

Prerequisite, Animal Husbandry 72 and permission of instructor.

91. (I) GENETICS AND EUGENICS.—This course, open to students other than those specializing in animal husbandry, deals with the general problems concerned in human reproduction and inheritance. The main topics studied will consist of the physiology of reproduction, the physical basis of inheritance, and the mode of transmission of human characteristics. Consideration will also be given to such questions as the causes of variation, the relative importance of genetic and environmental influences, the mechanism of sex determination as well as population trends, differential birth rates, sterilization, and kindred eugenic problems.

3 class hours. Credit, 3.
9:00-9:50 M. W. F. Mr. RICE.

BACTERIOLOGY AND PUBLIC HEALTH

Professor BRADLEY, Associate Professor GARVEY, Associate Professor FRANCE, Assistant Professor PERRIELLO, Assistant Professor LIPOVSKY, Mr. LARKIN, in cooperation with Dr. WALTER W. LEE, State District Health Officer; Mr. _____ and Mr. ERNEST A. SNOW of the Division of Sanitary Engineering of the Massachusetts Department of Public Health.

31. (I) and (II) INTRODUCTORY BACTERIOLOGY. LECTURES AND DEMONSTRATIONS.—Designed to present to students interested in general science, agriculture, horticulture, and home economics the fundamental concepts of bacteriological

science; make microorganisms real and significant; and demonstrate their importance in the problems of agriculture, general science, industry, public health, and medicine. This course is designed to accompany Bacteriology 31A, but may be elected without it. When elected separately this course will not satisfy the sophomore science requirement and cannot be offered as a prerequisite for other advanced courses in bacteriology.

2 class hours.

Credit, 2.

12:00-12:50 M. F. or Tu. Th.

Mr. BRADLEY or Mr. LIPOVSKY.

31A. (I) and (II) INTRODUCTORY BACTERIOLOGY. LABORATORY.—The work covers the use and care of the compound microscope, the preparation of culture media, methods of sterilizing equipment, the isolation and aseptic handling of pure cultures, simple and differential staining, bacterial classification and differential studies on type species of pathogenic and non-pathogenic bacteria. Designed to accompany Bacteriology 31.

2 2-hour laboratory periods.

Credit, 2.

Mr. FRANCE, Mr. LIPOVSKY, or Mr. LARKIN.

Prerequisite, Bacteriology 31, previously or concurrently.

51. (I) 52. (II) ADVANCED BACTERIOLOGY.—A continuation of introductory bacteriology. Studies on bacterial metabolism and the influence of environmental factors on growth and viability. The identification and differentiation of bacterial species by morphological, cultural, physiological, and serological studies; disinfectants and antibiotics. The combined courses give to the student not only a comprehensive picture of various forms of existing bacteria but develop a specialized technique for their cultivation, isolation, and identification.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 Tu. Th.

Miss GARVEY or Mr. LIPOVSKY.

Prerequisite, For 51, Bacteriology 31A; for 52, Bacteriology 51.

54. (I) and (II) WATER AND SEWAGE BACTERIOLOGY.—Elementary bacteriology with emphasis placed upon the importance of bacteria found in water and sewage. Work will include routine analysis used in the examination of water and sewage and in the laboratory control of water and sewage treatment plants.

2 3-hour laboratory periods.

Credit, 3.

2:00-4:50 Tu. Th.

Mr. PERRIELLO.

Prerequisite, Civil Engineering 77 or permission of the instructor.

55. (I) FUNDAMENTALS OF SOIL MICROBIOLOGY.—This course is designed for students majoring in agricultural and

related fields. Subjects included will be: fundamental laboratory procedures and techniques; quantitative and qualitative microbiological analyses of various types of soils; studies on the carbon and nitrogen cycles as affected by soil micro-organisms.

2 3-hour laboratory periods.

Credit, 3.
Mr. FRANCE.

81. (I) GENERAL APPLIED BACTERIOLOGY.—This course is designed to give the student a working knowledge of routine and special tests used in present day applied bacteriology. Subjects receiving consideration are: methods for determining the sanitary quality of milk and milk products, water and shellfish; eating and drinking utensils; and air.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F. or 1:00-3:50 W.; 9:00-11:50 S. Mr. FRANCE.

Prerequisite, Bacteriology 51 or permission of the instructor.

82. (II) FOOD BACTERIOLOGY.—Consideration will be given to (1) bacteriological principles which apply to the preservation, fermentation and spoilage of foods, (2) the sanitary examination of foods, (3) the causes of food poisoning, and (4) microbiological assays.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F. or Tu. Th. Miss GARVEY or Mr. LIPOVSKY.

Prerequisite, Bacteriology 51 or permission of the instructor.

85. (I) BACTERIOLOGY (IMMUNOLOGY).—Admission by permission of the instructor. This course includes consideration of host reactions which favor the prevention and cure of disease; qualitative and quantitative estimations of toxins and antitoxins; the use of biological products such as antigens and immune sera in differential bacteriology and in disease diagnosis; and a consideration of isohemagglutinins as determinants of blood groups.

2 3-hour laboratory periods.

Credit, 3.

1:00-3:50 M. F.

Miss GARVEY.

90. (II) SANITARY BACTERIOLOGY.—A detailed study of public health laboratory methods. Practical application of methods will be made through field studies.

1 4-hour and 1 2-hour laboratory period.

Credit, 3.

1:00-4:50 M., 1:00-2:50 F.

Mr. FRANCE.

Prerequisite, Bacteriology 81.

92. (II) CLINICAL LABORATORY METHODS.—This course is designated for students majoring in medical technology. The purpose of the course is to familiarize the student with routine clinical laboratory procedures.

1 4-hour laboratory period.

Credit, 3.

1:00-4:50 W., 3:00-4:50 F.

Mr. FRANCE.

Prerequisites, Bacteriology 85; Zoology 35, 69.

93. (I) 94. (II) PROBLEMS.—Qualified seniors who have obtained permission from the department may arrange for independent work on special problems in bacteriology.

Credit, 3.

THE DEPARTMENT.

Public Health

61. (I) 62. (II). GENERAL AND COMMUNITY SANITATION.—A study of the problems of general and community sanitation. Subjects discussed will include insect and rodent control, housing and slum clearance, ventilation, lighting, bathing places, sanitation of eating utensils, nuisances, camp sanitation industrial hygiene, water supplies, sewerage and sewage, refuse and garbage, food and milk sanitation.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th., 12:00-12:50 F. or 10:00-10:50 M. W. F.

Mr. BRADLEY or Mr. PERRIELLO.

63. (I) INDUSTRIAL HYGIENE AND SANITATION.—A comprehensive study of the practices and principles of industrial processes which may constitute problems in sanitation; industrial wastes, smoke abatement, and the health of the worker. Subject matter includes organization of programs and the formation of policies for the inspection of sanitary and mechanical facilities of factories, food processing plants and other industries.

3 class hours.

Credit, 3.

Mr. PERRIELLO.

64. (II) MICROSCOPY OF WATER.—A study of microscopic forms of life exclusive of the bacteria. Counting and control of plankton in potable waters. Elements of limnology.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 8:00-9:50 or 10:00-11:50 W. Mr. SNOW.

Prerequisite, Bacteriology 31A.

66. (I) and (II) PRINCIPLES OF SANITATION.—The application of sanitary engineering and related sanitary sciences to health problems in the environment of urban and rural communities.

2 class hours.

Credit, 2.

11:00-11:50 Tu. Th.

Mr. PERRIELLO.

Prerequisite, Civil Engineering 77 or permission of the instructor.

84. (II) PUBLIC HEALTH ADMINISTRATION.—Admission by approval of the instructor. The organization, function, and administration of governmental health agencies; the relationship of official and volunteer health agencies; preparation and presentation of lectures, demonstrations, and

exhibits. Public health laws, regulations, and sanitary codes, their origin and enforcement.

3 class hours.

10:00-10:50 M. W. F.

Credit, 3.

Mr. PERRIELLO.

86. (II) FIELD STUDIES IN SANITATION.—Trips will be taken into the field for the observation of public health practices in sewerage; sewage treatment and disposal; the production and purification of public water supplies; housing and slum clearance; insect and rodent nuisances; milk production, handling, and distribution; garbage and refuse collection and disposal; slaughter houses and rendering plants; cold storage warehouses; and bakery and restaurant sanitation. A comparative study of urban and rural services will be made. Although transportation will be furnished, students are expected to finance their own meals.

1 class hour; 1 4-hour laboratory period.

Hours by arrangement.

Prerequisites, Public Health 61 and 62.

Credit, 2.

Mr. BRADLEY.

88. (II) EPIDEMIOLOGY AND COMMUNICABLE DISEASE CONTROL.—Admission by approval of the instructors. Consideration of the factors involved in the spread of infections; a detailed discussion of the communicable diseases, their distribution, cause, epidemiology, and means of prevention and control. The use of vaccines, serums and drugs for prevention and treatment. Mass immunization programs.

3 class hours.

8:00-8:50 M. W. F.

Credit, 3.

Mr. LEE.

BOTANY

Professor OSMUN, Professor TORREY, Associate Professor HODGE, Associate Professor KOZLOWSKI, Assistant Professor BANFIELD, Mr. SPENCER, Mr. ARMY, Mr. DUNTON.

1. (I) and (II) INTRODUCTORY BOTANY.—The course sets forth a body of facts dealing with the morphology and physiology of plants which is not only a foundation for future professional work in biological science, but of intrinsic value to the educated layman. The topics of seed germination, ecological adaptations, floral structures, taxonomy, botanical history, cytology, wood-anatomy, plant physiology, and plant reproduction receive appropriate elementary treatment. The lectures attempt to interpret the facts of plant structure and function in the light of the major biological principles.

2 class hours; 2 2-hour laboratory periods.

Credit, 3.

Mr. TORREY, Mr. HODGE, Mr. SPENCER.

3. (I) and (II) THE PLANT KINGDOM.—This course is designed primarily for students outside the fields of biological science who desire to acquire a general knowledge of plant life without the necessity of pursuing further course work in the subject. The principles of plant life and types of plants

and plant groups composing the plant kingdom; relations of plants to each other, to other organisms, and to environment; the fundamental importance of green plants in the living world; reproduction, structure and physiological phenomena are presented.

2 class hours; 1 3-hour laboratory period.

Credit, 3.
Mr. HODGE.

25. (I) CRYPTOGAMIC BOTANY.—Selected forms typifying the slimemolds, bacteria, algae, fungi, lichens, liverworts, mosses and fernworts. The course has a two-fold purpose: (1) it is intended for students who desire to extend their knowledge to the principal branches of the plant kingdom, thus rounding out a general course of which Course 1 or Course 3 constitutes the first part; (2) it is also planned as an introduction to certain advanced courses for which it is prerequisite.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Mr. OSMUN, Mr. SPENCER.

Prerequisite, Botany 1.

26. (II) SPRING FLORA.—Designed to acquaint the student with the local Spring flora by a general study of the tracheate plants of that season (lycopods, horsetails, ferns, gymnosperms, and angiosperms). Laboratory work will include general morphological studies, the identification of native trees in the winter condition, the collection and preparation of an herbarium, and the identification of plants by standard manuals of botany. Competition for the Hills Botanical Prizes will be open to members of this course. Necessary materials require the expenditure of approximately \$15.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Mr. HODGE.

Prerequisite, Botany 25.

28. (II) PLANT PHYSIOLOGY.—Only for students intending to major in forestry. The processes occurring in plants with special emphasis on tree physiology and its relation to forestry problems.

3 class hours.

Credit, 3.
Mr. KOZLOWSKI.

Prerequisite, Botany 25.

51. (I) PLANT PATHOLOGY.—A basic course in plant pathology dealing with the nature, cause and control of plant disease. Particular attention is given to disease symptoms, the phenomena of infection and of parasitism, the sources of inoculum, the agents of disease transmission, the relation of environment to disease incidence and development and to general principles of plant disease control. The laboratory

phase is devoted to intensive study of a relatively few representative diseases induced by bacteria and fungi of the various classes.

1 class hour; 2 2-hour laboratory periods.
9:00-9:50 W.; 3:00-4:50 Tu. Th.

Credit, 3.
Mr. BANFIELD.

Prerequisite, Botany 25.

52. (II) ADVANCED PLANT PATHOLOGY (1950-51).—An extension of Course 51. The objective is that of providing the student with a general knowledge of the more common and representative plant disease problems. Students are granted the option in the laboratory of specializing in disease problems in their major field of interest. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.
9:00-9:50 W.; 3:00-4:50 Tu. Th.

Credit, 3.
Mr. BANFIELD.

Prerequisite, Botany 51.

58. (II) MICROTECHNIQUE.—A course in the preparation of microscopic mounts including the celloidin and paraffin methods and involving the use of microtomes and of differential stains.

2 2-hour laboratory periods.
1:00-2:50 Tu. Th.

Credit, 2.
Mr. TORREY.

Prerequisite, Botany 25.

59. (I) 60. (II) THE ANGIOSPERMS (1950-51).—Alternate with Courses 61 and 62. An evolutionary treatment of the angiosperm orders and families largely from the standpoint of floral and fruiting structures. Fundamental to intelligent determinative and taxonomic work on seed plants. Laboratory studies on types from the most important plant families. The department herbarium and greenhouses supply material of important tropical forms.

2 class hours; 1 2-hour laboratory period.
10:00-10:50 M. F.; 1:00-2:50 W.

Credit, 3.
Mr. TORREY.

Prerequisite, Botany 1.

61. (I) 62. (II) THE COMPARATIVE ANATOMY OF GREEN PLANTS (1949-50).—Alternate with Courses 59 and 60. The lectures deal with the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter, the department possesses excellent sets of micropreparations and lantern slides.

2 class hours; 1 2-hour laboratory period.
10:00-10:50 M. F.; 1:00-2:50 W.

Credit, 3.
Mr. TORREY.

Prerequisite, Botany 25.

64. (II) SYSTEMATIC MYCOLOGY (1949-50).—Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection, and

preservation of fungi; systems of classification; collateral reading. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

9:00-9:50 Tu.; 3:00-4:50 Tu. Th. Mr. BANFIELD.

Prerequisite, Botany 25.

65. (I) SYSTEMATIC MYCOLOGY (1949-50).—A continuation of Course 64. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

9:00-9:50 F.; 3:00-4:50 M. F. Mr. BANFIELD.

66. (II) INDUSTRIAL MYCOLOGY (1949-50).—Identification of the common yeasts and molds used in the manufacture of industrial products. Study and laboratory exercises in the processes involved. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

9:00-9:50 Th.; 3:00-4:50 M. F. Mr. BANFIELD.

67. (I) 68. (II) INTRODUCTORY PLANT PHYSIOLOGY.—A study of the processes occurring in plants and their relation to the complex of activities constituting plant growth. Topics include colloidal systems, osmotic phenomena, absorption, transpiration, and internal water relations of plants, photosynthesis, fat and protein synthesis, digestion, translocation, respiration, and growth. This is a basic course for students planning for advanced work in any branch of plant science.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

1:00-1:50 W.; 3:00-4:50 M.; 2:00-3:50 W.

Mr. KOZLOWSKI.

Prerequisites, Botany 25, Chemistry 29.

75. (I) METHODS IN PLANT PATHOLOGY (1950-51).—A course in the general techniques and specialized methods used in the investigation of plant diseases, including isolation, culture and pathogenicity studies of representative plant pathogens, the preparation and sterilization of various culture media, elementary staining and histological techniques, the use of the microscope, study of fungicides, and training in elementary photographic procedures. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

2:00-2:50; 10:00-11:50 T.; 3:00-4:50 F. Mr. BANFIELD.

Prerequisite, Botany 51.

76. (II) PROBLEMS IN PLANT PATHOLOGY (1950-51).—Given in alternate years.

3 2-hour laboratory periods.

Hours by arrangement.

Credit, 3.

Mr. BANFIELD.

Prerequisite, Botany 51.

77. (I) 78. (II) PLANT PHYSIOLOGY (1949-50).—Advanced study in physiology. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Hours by arrangement. Mr. KOZLOWSKI.

Prerequisites, Botany 67, 68; Chemistry 51, 52.

81. (I) PLANT ECOLOGY.—A survey of the general relationship of plants to their environment, including a study of the individual factors (autecology) and of plant communities (synecology). Special emphasis is placed on the structure and succession of plant communities in New England.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. HODGE.

Prerequisite, Botany 1; Botany 26 recommended.

84. (II) THE FERNS (1949-50).—Intensive study of the morphology, life-history, and taxonomy of the fern plants, with especial attention to the fern flora of New England. Given in alternate years.

1 class hour; 1 2-hour laboratory period. Credit, 2.
1:00-1:50 Th.; 1:00-2:50 Tu. Mr. OSMUN.

Prerequisite, Botany 25.

BUSINESS ADMINISTRATION

Professor GAMBLE, Professor HARDY, Professor KIMBALL, Associate Professor SIEVERS, Assistant Professor COLWELL, Assistant Professor DONALD, Assistant Professor DYMOND, Assistant Professor HOAR, Assistant Professor SMART, Mr. HUMMEL, Miss MATHIASSEN, Mr. NEEDHAM, Mr. RIVERS, Mr. SCHOEFFLER, Mr. SELDEN, Mr. SINGER.

Accounting

25. (I) PRINCIPLES OF BUSINESS ACCOUNTING.—This course aims to give the student a working knowledge of the principles underlying the accounting system in the gathering, analysis, and interpretation of accounting data. The managerial uses of accounting as a means of business control are the keystone of the course.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
2:00-2:50 or 3:00-3:50 W.; 1:00-2:50 or 3:00-4:50 M. F.

Mr. COLWELL, Mr. SINGER.

26. (II) PRINCIPLES OF BUSINESS ACCOUNTING.—This course covers the problems of partnership and corporation accounting. Considerable time is spent on problems in amortization, depreciation, and the preparation, analysis and interpretation of financial statements.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
2:00-2:50 W.; 1:00-2:50 M. F.

Mr. COLWELL, Mr. SINGER.

71. (I) **ADVANCED ACCOUNTING.**—A fuller treatment of the accounting and financial problems of business units, including illustrative problems and case material.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. SMART.

Prerequisite, Accounting 26.

72. (II) **ADVANCED ACCOUNTING.**—A continuation of Accounting 71.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. SMART.

Prerequisite, Accounting 71.

73. (I) **COST ACCOUNTING.**—The application of accounting techniques to industrial costs.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. COLWELL, Mr. SCHOEFFLER, Mr. SINGER.

Prerequisite, Accounting 26.

74. (II) **ACCOUNTING SYSTEMS.**—The application of accounting principles to representative types of business and the study of Federal Income Tax and Social Security accounting problems.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Accounting 73. Mr. COLWELL.

76. (II) **AUDITING.**—A course in the interpretation of accounting records dealing with theory and procedure. C.P.A. and American Institute of Accountants examination problems are studied.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Accounting 72 and 73. Mr. COLWELL.

Finance

53. (I) **MONEY, BANKING AND CREDIT.**—A critical survey of the development and operation of the monetary and banking systems of the United States.

3 class hours. Credit, 3.

Mr. GAMBLE, Mr. KIMBALL, AND THE DEPARTMENT.

65. (I) **CORPORATION FINANCE.**—An introductory course in business finance concerned with forms of ownership organization, the nature and uses of corporate securities, provision and maintenance of capital, financial expansion, and corporate reorganization.

3 class hours. Credit, 3.

Mr. KIMBALL, AND THE DEPARTMENT.

76. (II) **INSURANCE.**—A general course concerning certain risks to which individuals and business enterprises are exposed and the methods and institutions evolved to insure against loss arising from these hazards.

3 class hours. Credit, 3.

Mr. KIMBALL.

78. (II) PUBLIC FINANCE.—Principles of public revenues and expenditures with special emphasis on the systems and problems of taxation.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mr. GAMBLE.

81. (I) PROBLEMS IN BUSINESS FINANCE.—A study of problems of financial management of business corporations and the effects of financial policies on the individual firm and the economy as a whole.

3 class hours.

Credit, 3.

Mr. KIMBALL.

Prerequisite, Finance 65.

82. (II) INVESTMENTS.—The principles and techniques that are useful for the analysis and selection of investment media; investment policies of individuals and institutions.

3 class hours.

Credit, 3.

Mr. KIMBALL.

Prerequisite, Finance 65 or consent of instructor.

Business Law

70. (II) BUSINESS LAW.—This course consists of a study of the drawing, reading, and interpretation of contracts and sales, with specific problem work. In addition, wills, commercial paper, carriers, real estate agency, public and personal rights are studied.

3 class hours.

Credit, 3.

9:00-9:50 M. F.

Mr. SMART, Mr. NEEDHAM.

71. (I) LEGAL ASPECTS OF ECONOMIC TRANSACTIONS.—A continuation of Course 70.

3 class hours.

Credit, 3.

Mr. SMART.

Prerequisite, Business Law 70.

Industrial Administration

83. (I) BUSINESS MANAGEMENT.—A study of the problems connected with the management of a business enterprise.

3 class hours.

Credit, 3.

Mr. DYMOND, Mr. HOAR.

84. PERSONNEL ADMINISTRATION.—A study of the principles of the management of labor relations.

3 class hours.

Credit, 3.

Mr. HOAR.

Marketing

52. (II) INDUSTRIAL PURCHASING.—A study of the purchasing problems of industrial enterprises and their market contacts with their sources of supply.

3 class hours.

Credit, 3.

Mr. HUMMEL.

53. (I) **MARKETING AND MARKETING PROBLEMS.**—Not open to students who have taken or are taking Agricultural Economics 55. A study of the forces and conditions which determine prices and the mechanism, methods, and problems concerned with transporting, storing and distributing economic goods.

3 class hours.

Credit, 3.

10:00-10:50 Tu. S.; 11:00-11:50 Th.

Mr. HARDY, Mr. HUMMEL.

54. (II) **SALESMANSHIP AND SALES MANAGEMENT.**—The principles and practices of selling and the management of selling enterprises.

3 class hours.

Credit, 3.

Mr. HARDY.

71. (I) **RETAIL MERCHANDISING.**—A study of the operation and productive functions of retail business.

3 class hours.

Credit, 3.

Mr. HUMMEL.

72. (II) **MARKET RESEARCH.**—The aims, sources and fact-gathering methods of market research activities. General study and individual research projects.

3 class hours.

Credit, 3.

Mr. HUMMEL.

73. (I) **ADVERTISING.**—A study of the techniques and media of advertising, its services to business and the organization and economic function of the advertising industry.

3 class hours.

Credit, 3.

Mr. HARDY.

74. (II) **NEW ENGLAND MARKETS.**—Individual and group study of the marketing problems of New England industrial and marketing enterprises.

3 class hours.

Credit, 3.

Mr. HARDY.

CHEMISTRY AND CHEMICAL ENGINEERING

CHEMISTRY

Professor RITCHIE, Professor FESSENDEN, Professor SMITH, Associate Professor CANNON, Associate Professor BARRETT, Assistant Professor RICHASON, Assistant Professor

ROBERTS, Dr. PARROTT*, Mr. CRUICKSHANK, Mr.

OBERLANDER, Mr. POLCHLOPEK, Mr. WINER.

1. (I) 2. (II) **GENERAL CHEMISTRY.**—A study of the fundamental chemical laws and theories. A considerable amount of descriptive material will be included in connection with discussions of the periodic system, atomic structure, and in various applications of the principles. The object of

* On leave of absence for military service.

the course is to give the student a sound scientific training through a course in chemistry. Students who have had no previous work in chemistry will be grouped together in laboratory and recitation sections so that they may have special attention.

2 class hours; 1 quiz hour; 1 2-hour laboratory period.

Credit, 3.

Mr. FESSENDEN, Mr. RICHASON, Mr. OBERLANDER.

29. (I) and (II) QUALITATIVE ANALYSIS.—A study of the fundamental principles and laws concerning the behavior of solutions of electrolytes. The laboratory work deals with the characteristic properties, reactions, and the systemic separation and identification of the common cations and anions. The semi-micro technique is used throughout for the analysis of salts, salt mixtures, and alloys. A considerable portion of the laboratory work is devoted to the identification of substances unknown to the student. This course is designed to meet the needs not only of those students specializing in chemistry, but also of those students specializing in other subjects where inorganic chemistry is of importance.

2 class hours; 6 laboratory hours.

Credit, 4.

8:00-8:50 or 10:00-10:50 Tu. Th.; 8:00-9:50 or 10:00-11:50 M. W. F. or 1:00-3:50 M. F. or 1:00-3:50 Tu. Th.

Mr. SMITH.

Prerequisite, Chemistry 2.

30. (I) and (II) QUANTITATIVE ANALYSIS.—The theory and practice of representative determinations, both gravimetric and volumetric. The laboratory work will include the gravimetric analysis of chloride, sulfate, and limestone, volumetric work with acids and bases, volumetric precipitation methods, and oxidation reduction titrations.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

11:00-11:50 Tu. Th.; 1:00-3:50 M. F. or Tu. Th. or 1:00-3:50 W.; 9:00-11:50 S.

Mr. ROBERTS.

Prerequisite, Chemistry 29.

31. (I) 32. (II) ORGANIC CHEMISTRY.—A short course intended to satisfy the requirements in this field for all students who do not specialize in chemistry.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th.; 2:00-3:50 Th.

Mr. RITCHIE.

Prerequisites, Chemistry 1 and 2.

51. (I) 52. (II) ORGANIC CHEMISTRY.—A course in the theory of organic chemistry intended to serve the needs of students who will specialize in chemistry, as well as those who may specialize in other fields where a more comprehensive course is desired than Chemistry 31 and 32. The first semester deals largely with compounds of the aliphatic

series, while the benzene series is taken up in the second semester. Students electing this course should take both 51 and 52.

3 class hours; 1 3-hour laboratory period. Credit, 4.
9:00-9:50 M. W. F.; 1:00-3:50 M. W. or F.

Mr. RITCHIE, Mr. CANNON.

Prerequisite, Chemistry 29.

63. (I) CHEMISTRY OF WATER, SEWAGE AND SEWAGE SLUDGE.—Admission by permission of the instructor. The preparation of reagents and standard methods for the analysis of water, sewage and sewage sludge. Lectures and discussions on the sanitary significance of analytical data.

2 3-hour laboratory periods. Credit, 3.
1:00-3:50 W.; 9:00-11:50 S. Mr. _____

Prerequisite, Chemistry 30.

65. (I) 66. (II) PHYSICAL CHEMISTRY.—A study of the fundamental theories and laws of physical chemistry, together with the solution of problems involved in their application. The laboratory work will include practice in making physico-chemical measurements and the preparation of reports.

3 class hours; 1 3-hour laboratory period. Credit, 4.
8:00-8:50 or 11:00-11:50 M. W. F.; 1:00-3:50 M. W. or F.

Mr. FESSENDEN, Mr. SMITH.

Prerequisites, Chemistry 30; Mathematics 30; Physics 26.

78. (II) ADVANCED PHYSICAL CHEMISTRY.—A detailed study of a number of topics such as kinetics, catalysis, chemical thermodynamics and electrochemistry.

3 class hours. Credit, 3.

Mr. FESSENDEN.

Prerequisites, Chemistry 65 and 66.

79. (I) BIOCHEMISTRY.—An introduction to general biochemistry and physiological chemistry, with particular emphasis on the extension of fundamental organic chemistry to materials and processes of biological significance; proteins, lipids, carbohydrates, enzymes, etc. For students who expect to take up work in microbiology, botany, agronomy, nutrition, zoology, etc.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. BARRETT.

Prerequisite, Organic Chemistry.

80. (II) CLINICAL CHEMISTRY (Blood and Urine Analysis).—Work to be covered will include the collection and preparation of samples for analysis; standardization of glassware and the preparation of reagents; description of colorimeters and the determination of certain significant compounds in the samples. The latter group will include at

least sugars, proteins, non-protein, nitrogen, fatty substances and inorganic elements.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. BARRETT.

81. (I) ORGANIC CHEMISTRY.—A rapid and intensive survey of the important reactions of organic chemistry with emphasis on their scope and limitations, recent developments and theoretical aspects.

3 class hours. Credit, 3.
9:00-9:50 Tu. Th. S. Mr. CANNON.

82. (II) QUALITATIVE ORGANIC CHEMISTRY.—The characterization of organic compounds by means of physical properties, class reactions, and the preparation of suitable derivatives. The laboratory work will involve the identification of a number of simple unknown compounds followed by the separation, purification, and identification of the individual components in several unknown mixtures of organic compounds.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
1:00-1:50 Tu. Th.; 2:00-4:50 Tu. Th. Mr. CANNON.

83. (I) ADVANCED QUANTITATIVE ANALYSIS.—Designed primarily for chemistry majors, but open to others with permission of the instructor. The laboratory work will include representative determinations in electrolytic and electrometric methods; and an introduction to colorimetry and other optical methods of analysis. Selected topics in the use of organic precipitants, silicate analysis, analysis of steel and other alloys, fuels, oils, water, and gases will also be included.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. ROBERTS.

Prerequisite, Chemistry 30.

85. (I) THEORETICAL INORGANIC CHEMISTRY.—A survey of inorganic chemistry which is largely theoretical and includes such topics as atomic structure, periodic classification and relationships, valence concepts, acid-base theory, and the chemistry of the commercially important elements and their compounds based upon the periodic table.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. SMITH.

Prerequisite, Chemistry 65.

88. (II) HISTORY OF CHEMISTRY.—An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and

an appreciation of the true spirit of scientific research, through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of today.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. RITCHIE.

92. (II) INTRODUCTION RESEARCH.—Admission only by permission of the department. The aim of the course is to give the student an opportunity to learn the purpose and methods of research. To each student is assigned some special subject or problem in one of the following fields of chemistry, viz., analytical, biochemical, inorganic, organic, physical.

10 laboratory hours.

Credit, 5.

Hours by arrangement.

THE DEPARTMENT.

CHEMICAL ENGINEERING

Professor LINDSEY, Assistant Professor CASHIN, Mr. CHAKOUR.

55. (I) CALCULATIONS.—A problem course covering advanced stoichiometry, material balances, gas laws, vapor pressure, humidity, and fluid flow. Problems are of the industrial type.

3 class hours.

Credit, 3.

Mr. CASHIN.

Prerequisites, Chemistry 29, 30; Mathematics 31, 32; Physics 25, 26.

56. (II) UNIT OPERATIONS I.—A study of the fundamental principles underlying the unit operations of heat transfer, evaporation-diffusion processes, humidity, air conditioning, drying, and distillation. Solution of problems on the basis of actual operating data and descriptions of industrial process equipment are emphasized.

3 class hours.

Credit, 3.

Mr. CASHIN.

Prerequisites, Chemistry 65; Chemical Engineering 55.

57. (I) INORGANIC (INDUSTRIAL) TECHNOLOGY.—A study of the manufacture of some of the important inorganic chemicals. Topics studied include sulfuric acid, nitric acid, hydrochloric acid, ammonia, sodium carbonate, and sodium hydroxide with particular stress on the unit operations. Field trips will be included where possible.

3 class hours.

Credit, 3.

Mr. CHAKOUR.

Prerequisites, Chemistry 30; Physics 26.

58. (II) ORGANIC (INDUSTRIAL) TECHNOLOGY.—A study of some of the unit processes involved in the manufacture of organic materials. Unit processes studied include nitration, amination, halogenation, oxidation, and esterification. Field trips will be included where possible.

3 class hours.

Credit, 3.

Mr. CHAKOUR.

Prerequisite, Chemistry 51.

60. (II) HEAT-ENERGY RELATIONS.—A study of the laws of energy as applied to chemical engineering. A problem course covering internal energy, enthalpy, entropy, and free energy of matter. Applications to compression, refrigeration, real gases, and chemical equilibrium are studied.

3 class hours.

Credit, 3.

Mr. LINDSEY.

Prerequisites, Chemistry 65; Chemical Engineering 55.

75. (I) INSTRUMENTATION.—A detailed study of the underlying principles and practices of indicating, recording,

and controlling instruments actually used on industrial chemical process equipment.

3 class hours.

Credit, 2.

Mr. CASHIN.

Prerequisites, Physics 25, 26; Chemical Engineering 56.

76. (II) ABSTRACTS.—Individual reports, both oral and written, on subjects of interest taken from current chemical and chemical engineering literature.

2 class hours.

Credit, 2.

THE DEPARTMENT.

Prerequisite, Chemical Engineering 93.

89. (I) CHEMICAL ENGINEERING LABORATORY I.—A quantitative study of pilot plant sized chemical engineering equipment, illustrating the unit operations of fluid flow, heat transfer, distillation, etc. Special emphasis is placed on the securing of reliable data, correct operating techniques, and the importance of industrial report writing.

1 3-hour period.

Credit, 2.

THE DEPARTMENT.

Prerequisite, Chemical Engineering 56.

90. (II) CHEMICAL ENGINEERING LABORATORY.—A continuation of Course 89, including the study of continuous rectification, gas absorption, heat transfer, drying and filtration.

2 4-hour laboratory periods.

Credit, 4.

THE DEPARTMENT.

Prerequisites, Chemical Engineering 89, 93.

93. (I) COMPREHENSIVE PROBLEMS (PROJECTS).—The solution of comprehensive problems which involve the application and integration of a number of the principles studied in previous courses in chemistry and chemical engineering. Particular emphasis is placed on the presentation of the results as formal reports.

2 class hours; 1 3-hour period.

Credit, 3.

Mr. LINDSEY.

Prerequisites, Chemical Engineering 56, 60.

94. (II) COMPREHENSIVE PROBLEMS (PROJECTS) II.—The solution of problems similar to those in Course 93 will be undertaken, but in addition, will involve the application of principles studied in Course 97.

2 class hours; 2 3-hour periods.

Credit, 4.

Mr. LINDSEY.

Prerequisites, Chemical Engineering 93, 97.

97. (I) UNIT OPERATIONS II.—A continuation of Course 56, including the additional unit operations of gas absorption, absorption, solvent extraction, crystallization, filtration,

mixing, crushing and grinding, mechanical separation, and high pressure technique.

3 class hours.

Credit, 3.
Mr. CHAKOUR.

Prerequisite, Chemical Engineering 56.

98. (II) ADVANCED UNIT OPERATIONS.—A continuation of Course 97 with particular reference to diffusion processes and multi-component distillation.

2 class hours.

Credit, 2.
Mr. CASHIN.

Prerequisite, Chemical Engineering 97.

DAIRY INDUSTRY

Professor HANKINSON, Assistant Professor LINDQUIST,
Assistant Professor NELSON, Mr. FINNEGAN.

25. (I) GENERAL DAIRYING.—A general course, introductory to all other courses in dairy industry, for those who wish to take only one course in dairying to get a general knowledge of the subject. The work covers briefly: a study of milk, its secretion, composition, and various tests applied thereto; producing quality milk; methods of pasteurizing and handling milk and cream; the use of separators; elements of ice cream, butter, and cheese making.

2 class hours; 1 2-hour laboratory period. Credit, 3.
2:00-2:50 Tu. Th.; 9:00-10:50 W. or 3:00-4:50 Tu. or Th.

Mr. HANKINSON, Mr. FINNEGAN.

50. (II) JUDGING DAIRY PRODUCTS.—A study of market standards and grades of dairy products, with practice in judging milk, ice cream, butter, and cheese. The student learns to recognize quality in dairy products, to detect specific defects, and to know their causes and means of prevention. A team is chosen from this class to represent the University in two contests: Eastern States Intercollegiate Dairy Products Judging Contest, and Collegiate Students' International Contest in Judging Dairy Products.

1 2-hour laboratory period. Credit, 1.
3:00-4:50 F. Mr. NELSON.

52. (II) MARKET MILK.—A study of the various phases of the market milk industry; sanitary production, transportation, pasteurization and handling in the city plant; marketing, delivery systems, milk and its relation to public health, inspection, milk laws, food value, and advertising. Cultured milk and other milk drinks also are included. Some milk plants are visited, the cost of the trip not exceeding five dollars.

2 class hours; 2 2-hour laboratory periods. Credit, 4.
11:00-11:50 Tu. Th.; 8:00-9:50 Tu. Th.

Mr. LINDQUIST.

75. (I) DAIRY CHEMISTRY.—This course is a particular study of those physical and chemical principles which not only explain the behavior of milk and milk products in the various technological operations, but also provide a basic viewpoint for dairy research. The lectures will include discussions (1) of the constituents of milk in relation to other organic compounds, and (2) the physicochemical aspects of certain dairy phenomena such as foaming, coagulation, etc. The laboratory work will include many of the tests used commercially and in dairy research, emphasizing the principles and application of both qualitative and quantitative analysis as well as the technique of operating scientific apparatus.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-10:50 Tu.; 8:00-9:50 Th. Mr. NELSON.

Prerequisites, Dairy 25, Dairy 52, and Chemistry 52, or permission of the instructor.

77. (I) BUTTER AND CHEESE MAKING.—Half of the semester is devoted to butter making; the remainder to cheese making, condensed and powdered milk. The various phases of the butter industry studied are: separators and cream separation; pasteurization, neutralization, and ripening of cream; preparation of starter cultures; churning; marketing and scoring of butter; creamery management. The work in cheese making includes Cheddar, cream Neufchatel, cottage, processed cheeses, etc. The manufacture of condensed and powdered milk, and commercial casein is also covered.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
11:00-11:50 W. F.; 1:00-3:50 M. F.

Mr. LINDQUIST, Mr. NELSON, Mr. FINNEGAN.

Prerequisite, Dairy 25.

78. (II) ICE CREAM MAKING.—The course includes a study of the principles and practices of ice-cream making. The effects of such factors as composition, quality, pasteurization, homogenization, aging, and freezing on the finished product are considered. Sherbets, ices, fancy and individual forms, and all flavors of ice cream are studied. Some time is devoted to refrigeration, machinery, delivery equipment, and merchandising methods as they are related to the industry.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
11:00-11:50 W. F.; 1:00-3:50 Tu. Th. Mr. NELSON.

79. (I) 80. (II) SEMINAR.—For students specializing in dairy industry.

1 class hour. Credit, 1.
11:00-11:50 M. THE DEPARTMENT.

ECONOMICS

Professor GAMBLE, Professor KIMBALL, Associate Professor MITCHELL, Associate Professor MORRIS, Associate Professor SIEVERS, Assistant Professor COLWELL, Assistant Professor DONALD, Assistant Professor DYMOND, Assistant Professor FERWERDA, Assistant Professor HALLER, Assistant Professor HOAR, Mr. GOODWIN, Miss MATHIASSEN, Mr. MURPHY, Mr. NEEDHAM, Mr. RIVERS, Mr. SCHOEFFLER, Mr. SELDEN, Mr. VETTERLING.

11. (I) ECONOMIC GEOGRAPHY.—A study of the geographic distribution of natural and human resources and the economic and physiographic bases of agriculture, manufacturing, and allied industries.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. HALLER, Mr. HOAR.

12. (II) ECONOMIC HISTORY OF THE UNITED STATES.—A study of the significant factors in the economic development of the nation.

3 class hours.

Credit, 3.

Mr. HALLER.

25. (I) and (II) ELEMENTS OF ECONOMICS.—Definitions and introductory principles of production, exchange, and the financial organization of society, with a short survey of the economics of distribution and the use of wealth and income.

3 class hours.

Credit, 3.

Mr. GAMBLE AND THE DEPARTMENT.

26. (II) ELEMENTS OF DISTRIBUTION.—A continuation of Course 25 with emphasis on the study of wealth and income distribution.

3 class hours.

Credit, 3.

Prerequisite, Economics 25.

Mr. GAMBLE AND THE DEPARTMENT.

51. (I) ECONOMICS OF BUSINESS AND INDUSTRY.—A study of the industrial relationships and the principles upon which the production of economic goods is based, with particular emphasis upon administrative controls of cost, quality, quantity, standards, personnel and purchasing.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. COLWELL.

55. (I) ECONOMICS OF CONSUMPTION.—A study of patterns of consumption, standards of living and the sources and expenditure of individual and family incomes.

3 class hours.

Credit, 3.

Mr. HALLER.

56. (II) BUSINESS CYCLES.—A study of business fluctuations and an analysis of current business cycle theories.

3 class hours.

Credit, 3.

Mr. KIMBALL, Mr. DONALD, Mr. PINES.

70. (II) MONOPOLIES (1948-49).—A study of the growth, development, and social control of monopolies. Given in alternate years.

3 class hours.

Credit, 3.
Mr. HALLER.

73. (I) MODERN ECONOMIC THEORY.—A study of current theories about value, distribution and prices.

3 class hours.

Credit, 3.

Mr. MORRIS, Mr. MURPHY, Mr. SCHOEFFLER, Mr. SIEVERS.

74. (II) CURRENT ECONOMIC PROBLEMS.—An advanced course for those desirous of studying more intensively some current economic problems. Students will be encouraged to pursue lines of individual interest.

3 class hours.

Credit, 3.
THE DEPARTMENT.

76. (II) PRINCIPLES OF TRANSPORTATION.—The development of highway, waterway, and railway transportation, and its relation to the agricultural and industrial development of the country; the principles governing the operation and control of transportation agencies; present-day problems relating to the shipment of farm and industrial products, rates, facilities, and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation.

3 class hours.

Credit, 3.
Mr. HALLER, Mr. RIVERS.

77. (I) ECONOMICS OF INTERNATIONAL TRADE (1949-50). A study of the policies, principles, and practices of international trade. Given in alternate years.

3 class hours.

9:00-9:50 Tu. Th. S.

Credit, 3.
Mr. DONALD.

79. (I) LABOR PROBLEMS.—An analysis of the background and character of the modern labor problem with special references to the United States. Topics to be considered include: the problems of wages, hours, working conditions and unemployment; the trade union movement; and some agencies for the promotion of industrial peace.

3 class hours.

9:00-9:50 Tu. Th. S.

Credit, 3.

Mr. DONALD, Mr. DYMOND, Miss MATHIASSEN, Mr. MORRIS,
Mr. RIVERS.

80. (II) LABOR LEGISLATION.—A study of federal and state legislation affecting labor.

3 class hours.

Credit, 3.
Mr. MORRIS, Mr. HOAR.

91. (I) 92. (II) SEMINAR.—Research in economic theory; problems of labor, commerce, and industry. If desirable, some other economic study may be substituted. 1 or 2 2-hour conferences.

Credit, 1 to 3.

THE DEPARTMENT.

Government

25. (I) AMERICAN GOVERNMENT.—A study of the structure and operation of our federal government. The course is based on a study of the Constitution with reference to its historical development and interpretation. Special consideration is given to changes of the twentieth century and to present-day problems.

3 class hours.

Credit, 3.

THE DEPARTMENT.

28. (II) STATE AND LOCAL GOVERNMENT.—A survey of the governmental structure and functions of the American state and its local governments, with emphasis on state-local relationships.

3 class hours.

Credit, 3.

THE DEPARTMENT.

52. (II) EUROPEAN GOVERNMENTS.—Forms and methods of the governments of Europe: historic types and theories of government, progress and problems of democracy; dictatorships and totalitarian governments. Special study of the governments of England, France, Switzerland, Italy, Germany, and Russia.

3 class hours.

Credit, 3.

MR. FERWERDA.

61. (I) PUBLIC ADMINISTRATION.—A general survey of the field of public administration. Special emphasis will be placed on the principles of organization, the functions performed by administration, and the relation of administration to democracy.

3 class hours.

Credit, 3.

MR. GOODWIN.

62. (II) ADMINISTRATIVE LAW.—A study of government regulatory activities in relation to industry, agriculture, and labor, with emphasis on the legal framework within which these activities operate.

3 class hours.

Credit, 3.

MR. NEEDHAM.

63. (I) POLITICAL PARTIES AND ELECTIONS.—A study of the political process, and the nature and history of parties, pressure groups, nominations and elections.

3 class hours.

Credit, 3.

MR. MITCHELL.

64. (II) MUNICIPAL GOVERNMENT.—A survey of the governmental structure and function of American municipalities. Special attention is given to administrative problems arising from such functions as protection, education, welfare, correction, city planning and zoning.

3 class hours.

Credit, 3.

Mr. GOODWIN.

65. (I) CONSTITUTIONAL LAW.—An historical study of the fundamental rights and guarantees under the American Constitution as interpreted by decisions of the Supreme Court.

3 class hours.

Credit, 3.

Mr. NEEDHAM.

66. (II) AMERICAN POLITICAL THOUGHT.—A study of the development of American political thought from colonial times to the present, with emphasis upon writings of the period.

3 class hours.

Credit, 3.

Mr. MITCHELL.

67. (I) INTERNATIONAL GOVERNMENT.—A study of international organization in the twentieth century, with emphasis upon the League of Nations, the World Court, and the United Nations and its affiliated agencies.

3 class hours.

Credit, 3.

Mr. FERWERDA.

68. (II) INTERNATIONAL LAW.—A study of the origin, character, and function of international law.

3 class hours.

Credit, 3.

Mr. FERWERDA.

93. (I) 94. (II) SEMINAR.—A study of special problems in the field of government. For seniors only.

3 class hours.

Credit, 3.

Mr. MITCHELL AND THE DEPARTMENT.

EDUCATION

Professor PURVIS, Assistant Professor OLIVER, Assistant Professor ROURKE, Assistant Professor MCCARTHY, Assistant Professor WYMAN, Mr. TAFT¹, Mr. DAYTON.

51. (I) HISTORY OF EDUCATION.—Educational movements are traced from early Greece to the present with the aim of better understanding of modern education. This is normally the beginning course for students undertaking work in Education.

3 class hours.

Credit, 3.

Mr. PURVIS.

¹ State Supervisor for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational agricultural acts.

52. (II) PRINCIPLES AND METHODS OF TEACHING.—By means of discussion, case studies, and current educational literature, teaching ideals and procedures are set up. Application of the general principles are made in the major fields represented by the class.

3 class hours.

Credit, 3.

Mr. McCARTHY.

53. (I) EDUCATIONAL TESTS AND MEASUREMENTS.—The most serviceable tests and scales for measuring achievement are considered; test construction, administration, scoring, and interpretation of results are studied and practiced. Considerable attention is given to preparation of informal tests for diagnostic and grading purposes.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. ROURKE.

61. (I) METHODS IN ADULT EDUCATION.—Admission only by permission of instructor. The beginning Education course for juniors and seniors who are training for extension work and for others interested in teaching adults. Generally accepted methods of group and individual instruction with adults, and methods of developing leaders to carry on the work in the field.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. _____.

66. (II) PREPARATION AND USE OF AUDIO-VISUAL AIDS.—Study is made of available media of audio-visual aids to instruction, construction of visual material, and accepted methods of use.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. WYMAN.

72. (II) VOCATIONAL EDUCATION IN AGRICULTURE.—The course demands certain prerequisites of experience and a definite objective on the part of the student to enter the field of vocational agricultural teaching which makes it necessary for the student to seek permission to enter the course. It is the first of the series of special courses (72, 73, 75) required of candidates for the vocational teacher-training certificate. A survey of vocational education and an introduction to teaching of vocational agriculture at the secondary school level is the basis of the course. Certain information and observations in preparation for the apprenticeship course are offered.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

73. (I) and (II) APPRENTICE TEACHING IN AGRICULTURE.—For a limited number of qualified candidates in vocational education. A full year in absentia normally following the

junior year in college, teaching agriculture, horticulture, and related subjects. Candidates should have completed the course in Education 72, and in Education 52, if possible, and must apply early to the instructor of the course.

Maximum credit, 6.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

75. (I) **TECHNIQUE OF TEACHING VOCATIONAL AGRICULTURE.**—By arrangement with the instructor. Preferably this course should follow Courses 72 and 73. It covers the materials, methods, policies, and special requirements of Massachusetts for teaching agriculture and related subjects in high schools and special country schools. This is one of three courses required of candidates for the agricultural teacher-training certificates.

3 class hours.

Credit, 3.

Mr. OLIVER and VOCATIONAL DIVISION
of STATE DEPARTMENT OF EDUCATION.

83. (I) **SECONDARY EDUCATION IN AMERICA.**—This course presents a picture of the secondary school as a social agency, its relation to elementary and collegiate education, its aims, organizations, administration, curriculum procedures, and such other phases as are necessary to acquaint the student with this predominant level of our educational ladder.

3 class hours.

Credit, 3.

Mr. McCARTHY.

85. (I) and (II) **OBSERVATION AND PRACTICE TEACHING.**—Admission by permission of the Department. An opportunity to do regular teaching in cooperating high schools within commuting distance of the University. The student works under the supervision of a teacher with frequent visits from some member of the staff.

Credit, 3.

THE DEPARTMENT.

Prerequisites, Education 51, 52, 83 or their equivalent.

88. (II) **THE SCHOOL CURRICULUM.**—This course discusses the curriculum of schools of this country from the point of view of the general social philosophy which created it. It seeks to make clear to the student the various controversial issues regarding such concepts as progressive education, the core-curriculum, the experience curriculum, projects, etc. An outline course of study is prepared by each student in the field he is to teach.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. ROURKE.

90. (I) and (II) **EVALUATION OF LEARNING.**—For senior majors in Education. Tests and scales for measuring ability

and achievement; standard tests and interpretation of results; construction of informal tests for diagnostic and grading purposes.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. ROURKE.

91. (I) and (II) **SECONDARY SCHOOL CURRICULUM.**—For senior majors in Education. A consideration of learning material and activities and their organization in the subjects which these students are teaching, and the preparation of courses of study in those fields in the light of accepted educational practice.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. ROURKE.

Prerequisite, Education 51.

92. (I) and (II) **METHODS AND MANAGEMENT.**—For senior majors in Education. The basic methods underlying teaching and class management will be discussed and illustrated. The work in this course will be correlated as closely as possible with the observation and practice of the students in neighboring schools.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. PURVIS.

Prerequisite, Education 51.

93. (I) and (II) **PRINCIPLES OF SECONDARY EDUCATION.**—For senior majors in Education. Practical problems concerning the school as a social agency, its aims, characteristics of pupil population, program of study, guidance, extra curriculum, etc., from the point of view of situations met by teachers.

3 2-hour periods the first and each alternate week. Credit, 3.
Mr. MCCARTHY.

Prerequisite, Education 51.

94. (I) and (II) **PRACTICE TEACHING.**—For senior majors in Education. Five school days of observation and teaching each alternate week in neighboring secondary schools under supervision of competent teachers and members of the staff. The second and each alternate week.

Credit, 5.
THE DEPARTMENT.

Prerequisite, Education 51.

AGRICULTURAL ENGINEERING

Professor STAPLETON, Associate Professor MARKUSON,
Assistant Professor TAGUE, Assistant Professor PUSHEE,
Assistant Professor PFLUG, Mr. PATTERSON.

51. (I) **HOUSE PLANNING.**—Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen, and lighting, heating, water supply, and sewage disposal will be studied, together with a brief

history of the house materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing and to maintenance and overhead expense.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. MARKUSON.

55. (I) FARM SHOP.—For students in agriculture and horticulture. Laboratory exercises cover instruction and practice in the use of carpenter's tools in construction and in bench work, arc and gas welding, pipe fitting, soldering, use of machinist's tools in machinery repair, and the mixing and placing of concrete. Classroom instruction covers materials of construction and the utilization of local and special materials for these purposes.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. PUSHEE.

71. (I) FARM POWER.—The study of internal combustion engines used in farm tractors and power units.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. PFLUG.

Prerequisites, Civil Engineering 52, Mechanical Engineering 65, 68.

72. (II) DRAINAGE AND IRRIGATION ENGINEERING.—This course is an abridgment of Agricultural Engineering 78 for students not majoring in Engineering who do not have the prerequisites for Course 78.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

Mr. PFLUG.

73. (I) FARM STRUCTURES.—A study of the strength and durability of building materials, construction systems and the mechanical principles underlying their use in farm-construction. In the drafting room studies will be made of some major farm building and complete working drawings finished in all essential details.

1 class hour; 3 2-hour laboratory periods.

Credit, 4.

Mr. MARKUSON.

Prerequisites, Civil Engineering 34, 51; Mechanical Engineering 61.

74. (II) FARM STRUCTURES.—This course is an abridgment of Agricultural Engineering 73 for students not majoring in Engineering who do not have the prerequisites for Course 73.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. STAPLETON.

76. (II) AGRICULTURAL MACHINERY.—The study of design and operational problems of agricultural field machinery. 2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. STAPLETON.

Prerequisites, Civil Engineering 52, Mechanical Engineering 68, 83.

78. (II) DRAINAGE, RECLAMATION AND CONSERVATION.—The course covers the engineering phase of drainage and reclamation. The various systems are studied, complete layouts established in the field, and problems of flow and run-off given.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. PFLUG.

Prerequisites, Civil Engineering 25, 75 or 76; Agronomy 2.

80. (II) FOOD PROCESS ENGINEERING.—A study of food processing machinery and instrumentation.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. PFLUG.

83. (I) 84. (II) AGRICULTURAL ENGINEERING PROBLEMS.—Open only to seniors specializing in agricultural engineering. This course consists of individual problems chosen by the students under guidance of the department.

Hours by arrangement.

Credit, 3.

THE DEPARTMENT.

85. (I) RURAL ELECTRIFICATION.—A course devoted to the utilization of electricity in agriculture.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. STAPLETON, Mr. RINES.

Prerequisites, Electrical Engineering 61, 62.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in agricultural engineering.

1 class hour.

Credit, 1.

THE DEPARTMENT.

CIVIL ENGINEERING

Professor MARSTON, Professor WHITE, Associate Professor OSGOOD, Associate Professor HENDRICKSON, Assistant Professor ANDERSON, Mr. COFFEY, Mr. MARCUS, Mr. GROW, Mr. CARVER, Mr. GABRYS.

25. (I) SURVEYING.—The theory of surveying, description of field and office methods and procedure are given in the classroom. Topics covered are the use of the tape, transit, level, plane table, determination of latitude, longitude, and azimuth, principles of more precise measurements, and the elements of geodesy. The field and office work covers measurements and the plotting necessary for producing finished maps of small areas.

3 class hours; 2 3-hour laboratory periods.

Credit, 5.

Mr. ANDERSON.

Prerequisite, Mathematics 5.

26. (II) ROUTE SURVEYING.—The principles of location, curves and earthwork, and horizontal and vertical control nets for highways, railroads, pipe lines, and transmission lines are considered.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. HENDRICKSON.

Prerequisites, Civil Engineering 25 or 27.

27. (I) PLANE SURVEYING.—The basic principles of mensuration are discussed in class. Instruction and problems involving the use of the tape, transit and level are given in the field, and the preparation of a map of a small area is carried out in the drafting room. This course is not open to civil engineering students.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. ANDERSON.

Prerequisite, Mathematics 5 or 7.

28. (Summer) PROPERTY AND TOPOGRAPHIC SURVEYING.—This practice course consists of a transit and tape property survey in which reference to Registry of Deeds records is used, a plane table topographic survey of selected areas is made. Certain topics of advanced surveying such as triangulation and conformal coordinate systems are treated briefly as they relate to the topographic surveys.

3 44-hour weeks. Credit, 3.

Mr. HENDRICKSON, Mr. ANDERSON.

Prerequisite, Civil Engineering 25 or 27.

30. (Summer) ROUTE SURVEYING PRACTICE.—This practice course consists of a preliminary survey for a short highway location and of the preparation of maps and profile from the data recorded on the survey. The maps are to be used in C.E. 55 in choosing the final location of the route and in estimating earthwork quantities and cost.

3 44-hour weeks. Credit, 3.

Mr. OSGOOD.

Prerequisite, Civil Engineering 26.

34. (II) APPLIED MECHANICS (STATICS).—The following topics are considered: equilibrium of forces (colinear, concurrent, non-concurrent, and parallel in a plane and in space); friction; first and second moments; center of gravity. Both algebraic and graphical methods are covered.

3 class hours. Credit, 3.

Mr. WHITE, Mr. MARCUS.

Prerequisites, Physics 26; Mathematics 31.

51. (I) STRENGTH OF MATERIALS.—The following topics are considered: simple stresses and strains; combined stresses;

torsion; shear and bending moments in beams; stresses and deflections of beams; columns.

4 class hours.

Credit, 4.

Mr. WHITE, Mr. MARCUS, Mr. SOBALA.

Prerequisites, Civil Engineering 34; Mathematics 32.

52. (II) APPLIED MECHANICS (KINETICS).—The following topics are considered: kinematics; linear and angular motion of particles; motion of rigid bodies; work, energy, and power; impulse and momentum.

3 class hours.

Credit, 3.

Mr. WHITE, Mr. SOBALA, Mr. GROW.

Prerequisites, Civil Engineering 34; Mathematics 32.

53. (I) STRENGTH OF MATERIALS.—A shortened version of C.E. 51 for electrical and mechanical engineers in the industrial option.

3 class hours.

Credit, 3.

Mr. WHITE, Mr. COFFEY, Mr. MARCUS.

Prerequisites, Civil Engineering 34; Mathematics 32.

55. (I) HIGHWAY ENGINEERING.—The design features of highway construction and relative merits of various types of highway surfaces are discussed in class. Plans, profiles, cross sections, and specifications for a short section of highway are prepared.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. HENDRICKSON.

56. (II) TRANSPORTATION ENGINEERING.—A study of the basic principles of highway, railroad, water and air transportation. Operational requirements, economics of location, administration and finance, design considerations, and maintenance.

3 class hours.

Credit, 3.

Mr. HENDRICKSON.

Prerequisite, Civil Engineering 55.

61. (I) TESTING OF MATERIALS.—A study of laboratory methods for the determination of the physical properties of engineering materials and their behavior under stress. Usual methods supplemented by study of true stress-true strain for plastic action, stress analysis through strain study by photoelastic analysis and electric strain gages. Magnaflux and Zygo inspection, special hardness tests, X-ray examination and research problems included in the lecture material.

1 class hour; 1 3-hour laboratory period.

Credit, 2.

Mr. WHITE, Mr. COFFEY.

70. (II) THEORY OF STRUCTURES.—This course treats with the analysis of statically determinate structures of wood and steel, with reference to particular structures, such as

industrial and office buildings, highway and railway bridges. The use of influence lines in the study of movable loads is included.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. OSGOOD, Mr. GROW.

Prerequisite, Civil Engineering 51.

71. (I) STRUCTURAL DESIGN.—This course is an application of the theory of structures to engineering practice through the preparation of designs and drawings for structural frames, girders and trusses in steel and wood that together make up a complete building frame or bridge. Emphasis is placed upon the design of structural members and joints.

1 class hour; 2 3-hour laboratory periods. Credit, 3.

Mr. OSGOOD.

Prerequisite, Civil Engineering 70.

72. (II) ADVANCED STRUCTURAL THEORY.—The analysis and design of continuous beams and trusses, rigid frames, arches, and tall buildings are considered in this course. Statically indeterminate methods of finding stresses and deflections are used.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. OSGOOD.

Prerequisite, Civil Engineering 71.

73. (I) CONCRETE AND MASONRY.—A study of the general properties of plain and reinforced concrete is included in this course. Application is made to the design of beams, slabs, columns, walls and foundations for buildings; retaining walls, arches and bridges. Drawings are prepared for a reinforced concrete building. A study is made of the elements of masonry construction and the use of bricks, concrete units and bearing tile in building construction.

2 class hours; 2 3-hour laboratory periods. Credit, 4.

Mr. OSGOOD.

Prerequisite, Civil Engineering 51.

75. (I) FLUID MECHANICS.—This course is an abridgment of Civil Engineering 76.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. MARSTON.

Prerequisite, Civil Engineering 52.

76. (I) and (II) FLUID MECHANICS.—The following topics are considered: properties of fluids, gas laws, viscosity, static pressure, gages, buoyant forces, dynamics of fluids, Bernoulli's theorem, flow in pipes, orifices, nozzles, weirs, and open channels. Hydraulic similitude is also discussed.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. MARSTON.

Prerequisite, Civil Engineering 52 concurrently.

77. (I) WATER SUPPLY.—This course considers the engineering aspects of public water supply systems and includes the following topics: quantity of water required; hydrology; collection systems; distribution systems; pumping machinery; purification work. The laboratory period is used for inspection trips and the treatment of special problems.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. ANDERSON.

Prerequisite, Civil Engineering 76 or 75 concurrently.

78. (II) SANITARY ENGINEERING (SEWERAGE).—This course considers the engineering aspects of the design, construction, and maintenance of sewerage systems and includes the following topics: hydraulics of sewers, sanitary and storm sewers, sewage treatment, plant design and operation.

3 class hours. Credit, 3.

Mr. ANDERSON.

Prerequisite, Civil Engineering 77.

79. (I) WATER SUPPLY (1949-50).—This course is an abridgment of Civil Engineering 77 for non-engineering students. Given in alternate years.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. ANDERSON.

80. (II) SOIL MECHANICS.—This course is a study of the mechanical classification of soils based upon field and laboratory work and the validity of these classifications as a means of predicting soil behavior. The student is guided through case studies in embankment stability, seepage, and consolidation.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. HENDRICKSON.

Prerequisite, Geology 50.

81. (I) FOUNDATIONS.—A survey of modern theories and practice in transferring structural loads to earth masses. Pile foundations, spread footings, caissons, and buoyant systems are discussed.

2 class hours. Credit, 2.

Mr. HENDRICKSON.

Prerequisite, Civil Engineering 80.

90. (II) CONTRACTS, SPECIFICATIONS AND ESTIMATING.—A study of the essentials of contracts as applied to business procedures in the construction field, the purposes and make-up of specifications, and the processes of estimating through quantity, surveys and unit cost applications.

3 class hours. Credit, 3.

Mr. MARKUSON.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in civil engineering. Current engineering projects are described by student reports. The professional aspect of the civil engineer's work is stressed.

1 class hour.

Credit, 1.

THE DEPARTMENT.

94. (II) ADVANCED SURVEYING.—The following topics are included: elements of astronomy, precise methods of surveying, adjustment of observations and the elements of photogrammetry.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. HENDRICKSON.

Prerequisites, Civil Engineering 25, 28.

96. (II) HYDRAULIC ENGINEERING.—The analysis and design of hydraulic structures such as storage reservoirs, spillways, dams, levees, and shore protection and channel works are considered.

2 class hours. 1 3-hour laboratory period.

Credit, 3.

Mr. MARSTON.

Prerequisites, Civil Engineering 71, 73, 76.

ELECTRICAL ENGINEERING

Professor BROWN, Professor ROYS, Associate Professor WILSON, Associate Professor LANGFORD, Assistant Professor MOHN, Assistant Professor SMITH, Assistant Professor CHANG, Mr. SACHSE, Mr. JATRAS, Mr. LEVINE, Mr. MARSH.

40. (II) FUNDAMENTALS OF ELECTRICAL ENGINEERING.—This course is a study of direct-current circuits, magnetism and electromagnetism, magnetic fields in air and iron, induced and generated voltages, inductance, capacitance, electric fields, conduction in liquids, and basic electrical measurements. The laboratory is devoted largely to electrical measurements, including instrument calibration and standardization, electrical instruments, fluxmeters, permeameters, simple bridges and potentiometers, and stresses analysis of methods and accuracies.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. JATRAS.

Prerequisites, Physics 26; Mathematics 31.

51. (I) ALTERNATING-CURRENT CIRCUITS.—This course is a study of alternating currents in power and communication circuits, and includes instantaneous voltage and current relationships, vector representation, resonance phenomena, basic network theorems, coupled circuits, single phase and poly-phase circuits, power and power measurements, non-sinusoidal waves.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. JATRAS.

Prerequisite, Electrical Engineering 40.

53. (I) DIRECT-CURRENT MACHINERY.—This course is a study of direct-current generators and motors with respect to their characteristics, design, operation, applications, and control.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. SACHSE.

Prerequisite, Electrical Engineering 40.

54. (II) ALTERNATING-CURRENT MACHINERY.—This course is a study of alternating-current generators, motors, transformers, and converters with respect to their design, operation, control and applications.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisites, Electrical Engineering 51, 53.

57. (I) ENGINEERING ANALYSIS.—This course is a study of differential equations as applied to electric systems, hyperbolic, Bessel, and Legendre functions, vector analysis and calculus with applications to electricity and magnetism, elliptic integrals, and solutions of field problems by conformal mapping.

3 class hours.

Credit, 3.

Mr. MOHN.

Prerequisites, Mathematics 32; Electrical Engineering 40.

61. (I) 62. (II) PRINCIPLES OF ELECTRICAL ENGINEERING.—This course is designed for mechanical, industrial, and agricultural engineering students, and is a study of d-c and a-c circuits, d-c and a-c machines, and basic electronics.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. LEVINE, Mr. MARSH.

Prerequisites, Physics 26; Mathematics 32.

63. (I) ELEMENTS OF ELECTRICAL ENGINEERING.—This course is for civil and chemical engineering students and is a brief study of d-c and a-c circuits and machines.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SMITH.

Prerequisites, Physics 26; Mathematics 32.

65. (I) INDUSTRIAL APPLICATIONS.—This course is designed for mechanical and industrial engineering students and is a brief study of motor selection and control, protective devices, and electric and electronic applications in industry, including measurement and control.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SMITH.

Prerequisite, Electrical Engineering 62.

74. (II) ELECTRONICS.—This course includes the study of electron motion in electric and magnetic fields, electron

tubes and their characteristics, rectifiers, and Class A amplifiers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. MOHN.

Prerequisite, Electrical Engineering 51.

75. (I) APPLIED ELECTRONICS.—This is a continuation of Course 74 and includes a study of electron tubes and associated apparatus in power amplifiers, oscillators, amplitude and frequency modulation, detection, multivibrators, and vacuum tube instruments.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. LANGFORD.

Prerequisite, Electrical Engineering 74.

77. (I) ELECTRICAL TRANSMISSION.—This course is a review of fundamental circuit principles and theorems, Fourier Series and Integral and their applications to distorted waves and pulses, long lines and filters under steady state a-c conditions and traveling waves in transmission systems.

3 class hours.

Credit, 3.
Mr. ROYS,

Prerequisite, Electrical Engineering 51.

78. (II) TRANSIT ANALYSIS.—This course is a study of the transient behavior of electrical, mechanical and thermal systems, and includes the formulation of the ordinary and partial differential equations of dynamic systems and their solution by the classical and Heaviside methods and by Fourier and Laplace transforms.

3 class hours.

Credit, 3.
Mr. ROYS.

Prerequisites, Electrical Engineering 51, 57.

79. (I) ELECTRICAL COMMUNICATIONS.—This course is a study of the fundamentals of communication circuits, including circuit elements, basic network theorems, impedance transformations, equalizers, and bridge circuits.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. LANGFORD.

Prerequisite, Electrical Engineering 51.

80. (II) ELECTRICAL COMMUNICATIONS.—This is a continuation of Course 75 and includes a study of vacuum tube circuits used in communications, distortion, noise, class B and C power amplifiers, modulation and demodulation practice, oscillator design, transmitters and receivers, antennas and radiation, and electromechanical transducers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.
Mr. LANGFORD.

Prerequisites, Electrical Engineering 75, 79.

81. (I) **ADVANCED ELECTRICAL MACHINERY.**—This is a continuation of Course 54 and is a more advanced study of machines, including the general methods of machine analysis through the use of matrices, symmetrical components, equivalent circuits, and circle diagrams. Emphasis is placed on single-phase and variable-speed a-c motors, converters and inverters, selsyns and amplidynes, and multiwinding transformers.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisite, Electrical Engineering 54.

82. (II) **POWER APPLICATIONS IN INDUSTRY.**—This course is a study of industrial applications of electrical machines, and includes power supplies to industrial plants, load requirements, types of drives, mechanical requirements of variable speed drives, torque relations in d-c and a-c motors, motor applications and control, and selsyn systems.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisite, Electrical Engineering 81.

84. (II) **INDUSTRIAL ELECTRONICS.**—This course is a study of special characteristics of the electron tubes of industry, the theory, design and operation of commercial types of circuits utilizing these tubes, including stroboscopes, grid-controlled and polyphase rectifiers, inverters, welding controllers, speed and voltage regulators, high frequency heating circuits, etc.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. ROYS.

Prerequisite, Electrical Engineering 74.

86. (II) **POWER SYSTEM NETWORKS.**—This course is a study of power system networks including power transfer diagrams, voltage studies, system stability criteria, short-circuit calculations, and protective methods.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. WILSON.

Prerequisites, Electrical Engineering 77, 81.

88. (II) **COMMUNICATION NETWORKS.**—This is a continuation of Course 77, consisting of Foster's Reactance Theorem, the matrices of transducers and the principles of network synthesis. Applications include the analysis and design of filters, equalizers and other frequency responsive networks under both steady state and transient conditions.

3 class hours.

Credit, 3.

Mr. ROYS.

Prerequisites, Electrical Engineering 77, 79.

90. (II) ILLUMINATION.—This course is an introduction to illumination engineering and includes a study of light sources, units, measurements, vision, and lighting calculations and design.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. BROWN.

Prerequisites, Physics 26; Mathematics 32.

92. (II) PROFESSIONAL SEMINAR.—For seniors majoring in electrical engineering. Current engineering developments are discussed through student reports. The professional aspect of the electrical engineer's work is stressed.

1 2-hour period.

Credit, 1.

Mr. BROWN.

94. (II) ULTRA-HIGH-FREQUENCY TECHNIQUES. — This course is a study of u.h.f. oscillators, amplifiers, transmitters, receivers, transmission systems, antennas, multi-vibrators, trigger and gate circuits, electronic switches, and controls.

3 class hours; 1 3-hour laboratory period.

Credit, 4.

Mr. BROWN.

Prerequisites, Electrical Engineering 75, 79.

96. (II) ELECTROMAGNETIC ENGINEERING.—This course is a study of the fundamentals of electromagnetic radiation, including Ampere's and Faraday's laws, Gauss's theorem, retarded potential and Hertz' vector, Maxwell's equations, and the Poynting vector. These are applied to wave propagation, reflection and refraction, lines, wave guides and cavity resonators, antennas, and ionosphere reflections.

3 class hours.

Credit, 3.

Mr. ROYS.

Prerequisites, Electrical Engineering 57, 77.

MECHANICAL ENGINEERING

Professor BATES, Professor SWENSON, Professor WEAVER, Associate Professor WOLOWICZ, Assistant Professor KEYSER, Assistant Professor DITTFACH, Assistant Professor LONGSTAFF, Assistant Professor EMERSON, Assistant Professor LAKE, Assistant Professor ATHERTON, Mr. CARD, Mr. SOBALA.

1. (I) ENGINEERING DRAWING I.—The purpose of the course is to develop skill in the use of drafting equipment with a working knowledge of orthographic projections, lettering, auxiliary views, sectional views, tracings and pictorial representation of machine parts.

2 3-hour laboratory periods.

Credit, 2.

Mr. LAKE, Mr. CARD.

2. (II) ENGINEERING DRAWING II.—This course is designed to develop further skill in the use of drafting equipment and give practice in the making of working drawings

through the study of dimensioning, fastenings, conventional representations, detail and assembly drawings, and reading of working drawings. Graphs, and intersection and development problems will also be studied.

2 3-hour laboratory periods.

Credit, 2.

Mr. LAKE, Mr. CARD.

Prerequisite, Mechanical Engineering 1.

3. (I) DESCRIPTIVE GEOMETRY.—The course encompasses a study of the graphical methods applicable to engineering problems. Its content consists of the principles of orthographic projections, problems relating to lines and planes, graphic computations, polyhedrons, curved surfaces, warped surfaces and practical applications.

1 class hour; 1 3-hour laboratory period.

Credit, 2.

Mr. SWENSON, Mr. LONGSTAFF, Mr. ATHERTON.

Prerequisite, Mechanical Engineering 2.

23. (I) SHOP.—The course is designed primarily for engineers other than mechanical. Approximately half the semester is spent in woodworking, pattern making, and welding; in the other half the student gains experience in the machine shop, where he becomes familiar with the various machine and hand tools used in metal working.

2 4-hour laboratory periods.

Credit, 3.

Mr. LAKE, Mr. PUSHEE, Mr. PATTERSON.

27. (Summer) SHOP.—In the first part of the course woodworking and pattern making experience is gained on machines and with hand tools at the bench. The course then proceeds to the various methods of welding.

2 4-hour laboratory periods.

Credit, 3.

Mr. PUSHEE, Mr. PATTERSON.

28. (Summer) MACHINE SHOP.—A knowledge of metal-working equipment is obtained by using the fundamental machine tools such as the lathe, planer, shaper, milling machine and drill press. A reasonable amount of bench work is included. Classroom work is devoted to the theory of machine tool operation, fits, tolerances and measurement.

2 4-hour laboratory periods.

Credit, 3.

Mr. LAKE.

59. (I) and (II) MATERIALS OF CONSTRUCTION.—Properties of engineering materials; failure by (a) exceeding the elastic limit, (b) creep, (c) fatigue, and (d) corrosion. The crystalline nature of metals. Properties and uses of the structural metals, wood, stone, clay products, cementing materials, concrete, plastics, protective coatings, and water.

2 class hours.

Credit, 2.

Mr. KEYSER.

Prerequisites, Chemistry 1; Physics 26.

63. (I) ENGINEERING THERMODYNAMICS I.—This course is a treatment of the application of the laws of heat to various energy-transforming devices. Topics include ideal and actual cycles of steam, internal combustion engines, and air compressors together with problems pertaining to these machines, energy transformations in fluid flow, variable specific heats and mixtures of gases.

4 class hours.

Credit, 4.

Mr. SWENSON, Mr. LONGSTAFF, Mr. ATHERTON.

Prerequisites, Physics 26; Mathematics 30 or 32.

64. (II) ENGINEERING THERMODYNAMICS II.—A continuation of the work of Course 63. Study will be made of liquids and vapors, thermodynamic cycles, energy transformations and the transfer of heat, together with engineering problems pertaining to these devices.

4 class hours.

Credit, 3.

Mr. SWENSON, Mr. WOLOWICZ.

Prerequisite, Mechanical Engineering 63.

65. (I) HEAT ENGINEERING I.—This course is a survey of the field of applied energy and is designed for engineering students outside of the mechanical engineering field. The application of the laws of heat to energy transforming devices is studied, but not as extensively as in Courses 63 and 64. A study will be made of gases, vapors, fuels, combustion, heat transfer, measurement of power, and internal combustion engines.

3 class hours.

Credit, 3.

Mr. EMERSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisites, Physics 26; Mathematics 6.

66. (II) HEAT ENGINEERING II.—A continuation of the work of Course 65. Air compressors, fans, refrigeration, and air conditioning, turbines, jet propulsion and power plants will be studied.

3 class hours.

Credit, 3.

Mr. EMERSON, Mr. LONGSTAFF, Mr. CARD.

Prerequisite, Mechanical Engineering 65.

67. (I) MECHANICAL INSTRUMENTATION LABORATORY.—The calibration and application of instruments used in the testing of mechanical engineering apparatus.

1 3-hour laboratory period.

Credit, 1.

Mr. WOLOWICZ, Mr. DITTFACH, Mr. CARD.

Prerequisite, Mechanical Engineering 63 concurrently.

68. (II) KINEMATICS.—Principles of mechanism, including velocity and acceleration diagrams, instant centers, gear teeth and gear trains, cams, and various speed transmissions.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES, Mr. SOBALA.

Prerequisites, Mechanical Engineering 1; Civil Engineering 52.

72. (II) FUNDAMENTALS OF METALLURGY.—Physical metallurgy involving crystal structure, solid solutions, diffusion in the solid state, freezing of metals, hardening of metals, annealing, and equilibrium diagrams. These fundamentals are then applied to the study of the iron-iron carbide diagram, the S-curve, heat treatment of steel and the properties and uses of the other principal engineering metals. Laboratory work stresses metallographic and radiographic technique.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. KEYSER.

Prerequisite, Mechanical Engineering 59 or Chemistry 66.

75. (I) STEAM POWER PLANTS.—This course is a study of the steam power plant, including boilers, stokers, fuels, combustion, steam generation, prime movers, and auxiliary equipment, and engineering problems involved in design and operation.

3 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. SWENSON.

Prerequisite, Mechanical Engineering 64.

76. (II) REFRIGERATION AND AIR CONDITIONING.—The course content includes a study of the fundamental principles of thermodynamics as applied to refrigeration and air control. Application of refrigeration to industrial processes and the control of temperature, humidity and motion of air in buildings will be studied.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. SWENSON.

Prerequisite, Mechanical Engineering 64.

77. (I) INTERNAL COMBUSTION ENGINES.—A study is made of spark-ignition and compression-ignition engines including design, fuels, carburetion, ignition, combustion, lubrication, cooling, and engine performance. The gas turbine and jet propulsion will be included.

3 class hours.

Credit, 3.

Mr. DITTFACH.

Prerequisite, Mechanical Engineering 64.

79. (I) MECHANICAL ENGINEERING LABORATORY I.—Tests of fuels and lubricants. Performance tests of steam engines and turbines, gasoline and Diesel engines, fans, hydraulic apparatus, refrigeration systems and other typical engineering equipment. Emphasis on laboratory procedure and orderly presentation of results.

2 3-hour laboratory periods.

Credit, 2.

Mr. WOLOWICZ, Mr. DITTFACH, Mr. ATHERTON, Mr. CARD.

Prerequisites, Civil Engineering 76 or 75 concurrently; Mechanical Engineering 64 or 66; Mechanical Engineering 67 for Mechanical Engineering majors.

80. (II) MECHANICAL ENGINEERING LABORATORY II.—This course continues the work of the first semester in more advanced phases.

2 3-hour laboratory periods.

Credit, 2.

Mr. SWENSON, Mr. WOLOWICZ.

Prerequisite, Mechanical Engineering 79.

82. (II) FLUID MACHINERY.—Application of the principles of fluid mechanics to the theory of impulse and reaction water wheels, centrifugal pumps and compressors, and axial-flow blowers. Consideration is also given to the design of high pressure reciprocating and rotary pumps, hydraulic transmissions, sequence valves, etc., and their use in hydraulic-circuits.

3 class hours.

Credit, 3.

Mr. WOLOWICZ.

Prerequisite, Civil Engineering 76.

83. (I) MACHINE DESIGN.—Principles involved in the design of various machine parts including fastenings, shafts, belts, bearings, gears, and pressure vessels.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES, Mr. SOBALA.

Prerequisites, Civil Engineering 51 or 53; Mechanical Engineering 68.

85. (I) DYNAMICS OF MACHINERY.—Gyroscopic effects, governors, dynamic balancing of rotating machinery. Analysis of unbalanced forces in a machine containing parts moving with rotation, reciprocation, and their combination. Elements of vibration theory, vibration isolation, vibration analysis of equivalent masses and shaft systems. Vibration absorbers.

3 class hours.

Credit, 3.

Mr. WOLOWICZ.

Prerequisites, Civil Engineering 52; Mechanical Engineering 68.

86. (II) ADVANCED MACHINE DESIGN.—A continuation of Course 83. Additional elementary parts are studied which combine into the design of complete machines in the latter part of the course.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. BATES.

Prerequisite, Mechanical Engineering 83.

88. (II) STEADY FLOW MACHINERY.—The principles of thermodynamics are applied to steam and internal combustion turbines, condensers, and other heat transfer apparatus.

3 class hours.

Credit, 3.

Mr. SWENSON.

Prerequisites, Mechanical Engineering 64 or 66; Civil Engineering 76.

90. (II) **ADVANCED METALLURGY.**—Mechanical metallurgy covering the behavior of metals in the plastic state; the shaping of metals by mechanical means such as drawing, rolling, spinning, etc.; the primary methods of metal fabrication such as casting, welding, powder metallurgy, electroforming; the metallurgical applications of radiography.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. KEYSER.

Prerequisite, Mechanical Engineering 72.

91. (I) **PROFESSIONAL SEMINAR.**—For senior and graduate students only. Presentation of papers on various important subjects in the field of mechanical engineering, with principal emphasis on recent developments.

Credit, 1.

THE DEPARTMENT.

Industrial Engineering

25. (I) **MANUFACTURING PROCESSES.**—The methods of producing and fabricating the basic engineering materials: metals, cementing materials, ceramics, plastics, rubber, and lumber. Production methods (excluding machining) of metal parts and their assembly in a typical mass production industry is discussed. Laboratory periods involve inspection trips and movies.

1 class hour; 1 3-hour laboratory period.

Credit, 2.

Mr. KEYSER.

51. (I) **INDUSTRIAL MANAGEMENT.**—A course designed to acquaint the student with the principles of industrial engineering and their application to the solution of the problems of industrial plant operation.

3 class hours.

Credit, 3.

Mr. WEAVER.

75. (I) **JOB EVALUATION.**—A study of the principles used to determine an evaluation of all occupations in order to establish an equitable rating between them, to establish sound wage and salary policies.

3 class hours.

Credit, 2.

Mr. WEAVER.

Prerequisite, Industrial Engineering 51.

76. (II) **TIME STUDY.**—A study of the principles involved in the establishment of production standards and their application in the management functions of cost accounting, estimating, production control, incentives, budgetary control.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. WEAVER.

Prerequisites, Industrial Engineering 75, 82 concurrently except for Business Administration majors.

77. (I) PRODUCTION CONTROL.—A study of the principles used to regulate production activities in keeping with the manufacturing plan.

3 class hours.

Credit, 3.
Mr. EMERSON.

Prerequisite, Industrial Engineering 51.

78. (II) FACTORY PLANNING AND LAYOUT.—A study of the principles applying to the determination and development of the physical relationship between plant, equipment and operators working toward the highest degree of economy and effectiveness in operation.

1 class hour; 1 3-hour laboratory period.

Credit, 2.
Mr. SOBALA.

Prerequisites, Mechanical Engineering 2; Industrial Engineering 51.

80. (II) PLANT BUDGETARY CONTROL.—A study of the principles used to pre-determine expenses for the factors of production and the comparison of results with the estimates to determine and deal with the causes of expense variations as applied by the operating organization in the industrial plant.

3 class hours.

Credit, 3.
Mr. WEAVER.

Prerequisite, Industrial Engineering 51.

82. (II) WORK SIMPLIFICATION.—A study of the principles involved in the simplification of means of doing work and in the application and use of these principles.

1 class hour; 1 3-hour laboratory period.

Credit, 2.
Mr. WEAVER.

Prerequisites, Mechanical Engineering 68; Industrial Engineering 76 concurrently.

86. (II) INDUSTRIAL ENGINEERING.—A broad course dealing with the many problems encountered in a modern industry. Topics include types of organization, management, plant location, arrangement of equipment, product design, methods of production control, costs, wage payment systems and personnel relations.

3 class hours.

Credit, 3.
Mr. EMERSON.

92. (II) PROFESSIONAL SEMINAR.—For seniors and graduate students.

Credit, 1.
THE DEPARTMENT.

ENGLISH

Professor RAND, Professor GOLDBERG, Professor HELMING, Professor TROY, Associate Professor O'DONNELL, Assistant Professor HERRIGAN, Assistant Professor DU BOIS, Assistant Professor VARLEY, Assistant Professor LANE, Assistant Professor ALLEN, Assistant Professor WILLIAMS, Mrs. WRIGHT, Mr. KAPLAN, Mr. MARCUS, Miss TARANTINO, Mr. DIFFLEY, Mr. BARRON.

Composition

1. (I) 2. (II) ENGLISH COMPOSITION.—Intended to teach straight thinking, sound structure, clear and correct expression. Scheduled hours include Speech 3. (I) 4. (II).
2 class hours. Credit, 2.

THE DEPARTMENT.

81. (I) (II) CREATIVE WRITING.—A course in critical and imaginative composition based upon the examples of standard authors and the experience of the student. It provides an opportunity for work in description, narrative, verse and drama as well as in exposition.
3 class hours. Credit, 3.
Mr. TROY, Mr. VARLEY, Mr. LANE, Mr. ALLEN, Mr. WILLIAMS.
Prerequisite, a mark of A or B in English 2 (U. of M.) or permission of instructor.

83. (I) (II) TECHNICAL WRITING.—For majors in engineering. A course in factual and inductive exposition with special emphasis upon process reports and theses.
2 class hours. Credit, 2.
Mr. DIFFLEY.

Prerequisites, English 1, 2.

84. (II) TECHNICAL WRITING.—For students not majoring in engineering. A course in factual and inductive exposition with special emphasis upon library research and the preparation of reports, essays, and theses.
3 class hours. Credit, 3.
Mr. VARLEY, Mr. ZAITZ, Mr. DIFFLEY.
Prerequisites, English 1, 2.

Literature

25. (I) 26. (II) A SURVEY OF LITERATURE.—A general reading course based upon a chronological selection of masterpieces, both classical and English.
3 class hours. Credit, 3.

THE DEPARTMENT.

50. (II) CHAUCER.—A study of Chaucer's development and preeminence as a creative artist and an attempt to appreciate his humanism.
3 class hours. Credit, 3.

Mr. HELMING.

51. (I) THE RENAISSANCE IN ENGLAND.—A study of various aspects of the Renaissance as revealed in such writers as Spenser, Bacon, Sir Thomas Browne, Burton, and Hobbes. Special emphasis is given to Spenser's *Faerie Queene*.

3 class hours.

Credit, 3.
Mr. TROY.

53. (I) LYRICAL POETRY OF THE RENAISSANCE IN ENGLAND (1950-51).—A study of lyrical poets such as Sidney, Campion, Jonson, Herrick, Lovelace, Suckling, Carew, Donne, Herbert, Vaughn, Crawshaw, Traherne and Marvell.

Special emphasis is given to the "Metaphysical" tradition. Given in alternate years.

3 class hours.

Credit, 3.
Mr. GOLDBERG.

54. (II) MILTON.—The development of the mind and art of Milton as a Renaissance writer. Emphasis is placed upon *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*.

3 class hours.

Credit, 3.
Mr. GOLDBERG, Mr. HELMING.

55. (I) SHAKESPEARE.—This course is based upon the reading of about twenty-five of Shakespeare's plays, and attempts both to indicate the evolution of the dramatist and to emphasize the various phases of his art.

3 class hours.

Credit, 3.
Mr. RAND.

67. (I) AMERICAN PROSE.—A course in the chief American prose writers of the nineteenth and twentieth centuries. Among the authors studied are Emerson, Thoreau, Hawthorne, Melville, Mark Twain, Henry Adams, and Henry James.

3 class hours.

Credit, 3.
Mr. O'DONNELL.

57. (I) ELIZABETHAN DRAMATISTS.—A study of Elizabethan Drama, exclusive of Shakespeare, with special consideration of the plays of such men as Lyly, Peele, Green, Kyd, Marlowe. Not offered 1950-51.

3 class hours.

Credit, 3.
Mr. ———.

58. (II) ELIZABETHAN DRAMATISTS.—A continuation of English 57, with special consideration of the plays of Jonson, Beaumont, Fletcher, Webster, Ford, Marlowe, Middleton and Kyd.

3 class hours.

Credit, 3.
Mr. O'DONNELL.

59. (I) ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY.—A study of the literature of the Augustan Age, with special emphasis on the writings of Swift and Pope.

3 class hours.

Credit, 3.

Mr. TROY.

60. (II) ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY.—A continuation of English 59, but may be elected independently. A study of the literature of the later Eighteenth Century with special emphasis on the Johnson Circle.

3 class hours.

Credit, 3.

Mr. TROY.

61. (I) ROMANTIC POETRY (1950-51).—A study of the Lake Poets (primarily Wordsworth and Coleridge) and their precursors. Given in alternate years.

3 class hours.

Credit, 3.

Mr. RAND.

62. (II) ROMANTIC POETRY (1950-51).—A continuation of English 61 but may be elected independently. A study of Byron, Shelley and Keats. Given in alternate years.

3 class hours.

Credit, 3.

Miss HARRIGAN.

63. (I) AMERICAN POETRY.—A study of American poetry from Colonial times to 1900, with special emphasis upon the work of Freneau, Bryant, Emerson, Longfellow, Whittier, Poe, Whitman, and Emily Dickinson.

3 class hours.

Credit, 3.

Mr. DuBOIS.

69. (I) VICTORIAN POETRY (1951-52).—A study of Tennyson and Browning. Given in alternate years.

3 class hours.

Credit, 3.

Mr. RAND.

65. (I) ENGLISH PROSE OF THE NINETEENTH CENTURY.—A study of the chief Romantic prose writers in relation to literary techniques and main currents of epochal thought and feeling. Among the authors treated are Coleridge, Lamb, Hazlitt, DeQuincey, Carlyle, and Ruskin.

3 class hours.

Credit, 3.

Mr. GOLDBERG.

66. (II) ENGLISH PROSE OF THE NINETEENTH CENTURY.—A continuation of English 65, but may be elected independently. A study of the chief Victorian prose writers in relation to literary techniques and main currents of epochal thought

and feeling. Among the authors treated are Macaulay, Newman, Arnold, Huxley, Pater, and Stevenson.

3 class hours.

Credit, 3.

Mr. GOLDBERG.

68. (II) MODERN DRAMA.—This course traces the development of English and American drama from the time of Ibsen to the present day. Its purpose is to impart an intelligent and enthusiastic interest in the theatre of the twentieth century.

3 class hours.

Credit, 3.

Mr. RAND, Mr. WILLIAMS.

73. (I) ENGLISH PROSE FICTION.—A course designed to illustrate the development of English prose fiction, with emphasis upon the great novels of the eighteenth and nineteenth centuries.

3 class hours.

Credit, 3.

Mr. HELMING, Mr. ALLEN.

71. (I) BIOGRAPHY.—The history of the biography as a literary type; discussion of leading biographers from Boswell to Maurois, with special emphasis upon the development of the modern biographical method.

3 class hours.

Credit, 3.

Mr. HELMING.

72. (II) THE BIBLE AS LITERATURE.—A study of the King James version of the Bible, with emphasis upon the Hebrew as discernible in translation, the poetic qualities characteristic of Tudor England, and the varied influence of the Bible upon subsequent English poetry.

Mr. RAND, Mr. GOLDBERG.

74. (II) GREEK CLASSICS IN TRANSLATION.—Readings and discussion of the epics of Homer, representative dramas of Aeschylus, Sophocles, Euripides, and Aristophanes, the "Socratic" dialogues of Plato, and Thucydides' history of the Peloponnesian War. Intended to acquaint students with the famous myths and stories of classical antiquity, and the literary forms and ideas which have contributed most to subsequent literatures.

3 class hours.

Credit, 3.

Mr. HELMING, Mr. TROY.

76. (II) MODERN POETRY.—This course attempts to trace the spirit of twentieth century poetry from such authors as Hardy, Whitman, and Emily Dickinson to those of the present day.

3 class hours.

Credit, 3.

Mr. RAND, Miss HERRIGAN.

77. (I) THE MODERN NOVEL.—An analytical presentation of eleven novels written between 1890 and 1930, in which the expanding form and the extension of critical themes will be stressed.

3 class hours.

Credit, 3.

Mr. VARLEY.

79. (I) LITERARY CRITICISM (1951-52).—A study of major critical attitudes and principles, in relation to philosophic background and to practice. Emphasis is placed upon important critics and theorists from Plato and Aristotle through those of the eighteenth century. Given in alternate years.

3 class hours.

Credit, 3.

Mr. GOLDBERG.

80. (II) LITERARY CRITICISM (1949-50).—A continuation of English 79, but may be elected independently. Emphasis is placed upon important critics and theorists of the nineteenth and twentieth centuries. Given in alternate years.

3 class hours.

Credit, 3.

Mr. GOLDBERG.

ENTOMOLOGY

Professor ALEXANDER, Professor SWEETMAN, Assistant Professor HANSON, Assistant Professor SHAW, Dr. SMITH, Mr. FIELD.

26. (II) GENERAL AND FIELD ENTOMOLOGY.—The lectures are devoted to a brief survey of the entire field of entomology; structure and metamorphosis; the more important methods and materials for control of injurious species; a survey of the more conspicuous and important insects with particular attention to the fauna of New England. A laboratory period will be devoted to the preparation and formation of a collection of insects. Until about April 10th, this work will be done indoors and will consist of lectures and practical work preparatory to the field work after that date. Collections made by the students are studied in later courses.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 M. F.; 1:00-2:50 M. Tu. W. Th. F.

Mr. ALEXANDER, Miss SMITH.

51. (I) PESTS OF SPECIAL CROPS.—For students not specializing in entomology who desire a more complete knowledge of the insects connected with their major lines of work. Work in the laboratory consists of identification, life-history studies and control measures of important insect pests. Work of this nature is available on pests of field crops, market-garden crops, fruits, flowers, shade trees and shrubs, forest trees, household articles, domestic animals, and man.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 M.; 1:00-2:50 Tu.; 2:00-3:50 Th. Mr. SHAW.

Prerequisite, Entomology 26.

53. (I) APPLIED ENTOMOLOGY.—Studies on the more important insect pests, their life-histories, damage, identification, and methods of control. Special attention is devoted to the use of entomological literature, methods of preparing scientific papers, and the general principles of insect control.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 W.; 3:00-4:50 M. F.

Mr. FIELD.

Prerequisite, Entomology 26.

55. (I) 56. (II) CLASSIFICATION OF INSECTS.—Laboratory work on the identification of the major orders of insects. In Course 56, the immature stages of insects, with particular stress on their structure and recognition.

3 2-hour laboratory periods.

Credit, 3.

8:00-9:50 Tu. Th. S.

Mr. ALEXANDER, Miss SMITH.

Prerequisites, Entomology 26; Entomology 57, previously or concurrently.

57. (I) INSECT MORPHOLOGY.—The lectures treat of the internal and external anatomy of insects, particular stress being placed on those structures needed in classification, for use in the parallel Course 55. In the laboratory, the internal and external anatomy of the more important groups is studied, with emphasis on those characters most used in the determination of insects.

1 class hour; 3 2-hour laboratory periods.

Credit, 4.

10:00-10:50 F.; 1:00-2:50 M. Tu. F.

Mr. HANSON.

Prerequisite, Entomology 26.

60. (II) STRUCTURAL PEST CONTROL.—For students specializing in entomology, especially those desiring to enter the structural pest field, and others interested in gaining knowledge of methods of combating insect and rodent pests. The emphasis will be placed on the control of those pests attacking buildings and other structures, foods, fabrics, and other stored products in private homes or other establishments. The life history, feeding habits, methods of reproduction, and dispersal of the various species will be stressed in so far as these influence control measures.

2 class hours.

Credit, 2.

11:00-11:50 M. F.

Mr. SWEETMAN.

Prerequisite, Zoology 1; Entomology 26 desirable.

72. (II) FOREST AND SHADE-TREE INSECT.—The lecture work deals with the principles and methods of controlling insects which attack shade trees, forests and forest products. The laboratory periods are devoted to a study of the more important species, their identification, biology, and specific control measures.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 1:00-2:50 M. F.

Mr. HANSON, Mr. FIELD.

Prerequisite, Entomology 26; 53, 55, 56, and 57 desirable.

74. (II) MEDICAL ENTOMOLOGY.—Diseases of man and animals that are transmitted by insects and other arthropods. Especial attention is given to such transmission under war conditions, and to camp sanitation and similar topics.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 W.; 3:00-4:50 Tu. Th.

Mr. SHAW.

Prerequisite, Entomology 26.

79. (I) ANIMAL ECOLOGY.—Designed for students specializing in entomology, zoology, and related fields. The course deals with the relation of animals to their environment, covering the physical factors as temperature, moisture, light, etc., and the biotic factors as neighbors, competitors, predators, etc.. Both terrestrial and aquatic communities are studied. The student is shown not only that animals do things, but why they make definite responses to the environmental factors. Actual measurements of the environmental factors and responses of the animals in the field and laboratory are included.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 3:00-4:50 M.

Mr. SWEETMAN.

Prerequisite, Entomology 26 or Zoology 1 or equivalent.

80. (II) INSECT CONTROL.—The scientific basis of insect control is considered from the chemical, biological, ecological, mechanical, and legislative approaches. Special emphasis is placed on the composition, manufacture, preparation, and reaction of insecticides, and the use of resistant hosts, micro-organisms and the larger parasites and predators that might be used in the control of insects.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 M.; 3:00-4:50 M. F.

Mr. SWEETMAN.

Prerequisites, Entomology 53, 55, and 57; 79 and 81 desirable.

81. (I) PHYSIOLOGICAL ENTOMOLOGY.—A detailed consideration is given to the organ systems, showing the functions such as nutrition, respiration, and growth, and the relationship of physiology to behavior. A portion of the laboratory time will be devoted to assigned individual problems dealing with any phase of insect biology or control and conducted on a research basis.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 Th.; 3:00-4:50 W. F.

Mr. SWEETMAN.

Prerequisite, Entomology 26; 55, 56, and 57 desirable.

87. (I) 88. (II) SPECIAL PROBLEMS IN ENTOMOLOGY.—Problem work in many fields, as apiculture, biological control and insectary practice, insecticides, morphology, and classification. Intended primarily to introduce qualified students

to research methods in some branch of entomology. Excess departmental credits are necessary for election.

Hours by arrangement.

Credit, 1, 2, or 3.

THE DEPARTMENT.

Prerequisites, Entomology 26, 53, 55, 57, and should be preceded or accompanied by any other courses in the restricted field of the problem.

90. (II) EVOLUTION.—In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind; the evolution of human intelligence, and man's probable future in the light of his past development. Especial consideration is given to the factors of evolution, the basic principles of heredity, variation, and similar topics, with particular reference to their application to human welfare.

2 class hours.

Credit, 2.

10:00-10:50 M. F.

Mr. HANSON.

Apiculture

66. (II) INTRODUCTION BEEKEEPING.—The laboratory work consists of a study of beekeeping equipment and the methods of assembling this material; a study of pollen and honey plants; spring management. The lectures are intended to give the student a broad grasp of the entire field of beekeeping, considering such subjects as history; statistics of beekeeping in America; the races of bees; methods of management; bee-diseases; pollination; queen-rearing.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. F.; 1:00-2:50 M.

Mr. SHAW.

85. (I) ADVANCED BEEKEEPING.—The laboratory work consists of fall management, care of the honey crop, preparation of colonies for wintering, bee-diseases, and some simple types of biometrical problems. The lectures consider, among other things, the physical and chemical characteristics of honey and wax; chemical tests to detect adulteration of honey; bee-diseases; and biometry.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. SHAW.

Prerequisite, Entomology 66.

BIOLOGICAL FIELD STUDIES

Professor VINAL.

51. (I) 52. (II) BIOLOGICAL FIELD STUDIES (1949-50).—Course 51 is devoted to field studies with fall flowers, trees in winter, wood specimens, evergreens and the making of terraria. Course 52 deals with topography, glaciers, minerals, birds, and spring flowers with special emphasis on methods, skills and techniques of leadership in nature education. These courses are required of students specializing in recreational leadership. Enrollment limited to twenty-five. Given in alternate years.

1 class hour; 2 2-hour field periods.

Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th.

Mr. VINAL.

61. (I) 62. (II) PUBLIC RELATIONS IN NATURE RECREATION.—For juniors and seniors specializing in recreational leadership; others may elect by special arrangement with the instructor. A course in public contacts designed to bring to the attention of the student the natural history background with which one must be familiar if he is to succeed in public work. Community facilities, population, land use, climate, housing, good rural life in relation to community planning and nature recreation, are some of the factors to be considered. Each student will be expected to make a survey of his home town.

3 class hours.

Credit, 3.

10:00-10:50 Tu. Th.

Mr. VINAL

71. (I) 72. (II) ADVANCED BIOLOGICAL FIELD STUDIES (1950-51).—This course is devoted to field studies with cultivated plants, bog plants, the seabeach, salt water and fresh water aquaria, shell fish, amateur weather bureau, conservation, camping education, the observation bee hive, gardening, school and community forests, animals in winter Community service is expected. Enrollment limited to twenty-five. Given in alternate years.

1 class hour; 2 2-hour field periods.

Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th.

Mr. VINAL.

73. (I) 74. (II) SPECIAL PROBLEMS IN NATURAL SCIENCE.—For juniors and seniors specializing in recreational leadership. It is expected that the problem will relate to the immediate career which the student has in view.

3 class hours.

Credit, 3.

Hours by arrangement.

Mr. VINAL.

FINE ARTS

Assistant Professor ROBERTSON, Assistant Professor ALVIANI,
Mr. SCHABAS.

Art

27. MODELING.—A course in elementary modeling, of seeing, analyzing, and reproducing form in clay and modeling wax to develop sculptural technique.

6 laboratory hours.

Credit, 3.

Mr. ROBERTSON.

28. MODELING. — A continuation of Course 27 in advanced design and the making of plaster casts from original problems in small sculpture, such as plaques, masks, and medals or other such pieces.

6 laboratory hours.

Credit, 3.

Mr. ROBERTSON.

Prerequisite, Art. 27.

31. (I) ELEMENTARY DESIGN.—For women. Elementary principles of design as applied to textiles, fabrics, interior decorations, etc.

3 2-hour laboratory periods.

Credit, 3.

Mr. MACIVER.

33. (I) FREEHAND DRAWING.—A non-professional course in elementary drawing and painting in various media in black and white. The work is more or less personal and is adapted to the individual capacities and backgrounds of each student as far as possible.

6 laboratory hours.

Credit, 3.

Mr. MACIVER.

34. (II) FREEHAND DRAWING.—This non-professional course is essentially one in which the use of color is stressed in various media, freehand drawing is emphasized and paintings in still-life and landscape subjects are produced.

6 laboratory hours.

Credit, 3.

Mr. MACIVER.

75. (I) ART APPRECIATION.—An analysis of the principles of critical judgment underlying the fine arts, leading toward the enjoyment of art and its application to every day life.

3 class hours.

Credit, 3.

Mr. OTTO.

77. (I) EARLY AND MEDIEVAL ART.—An appreciative survey of art and history from early times through the medieval period. Works in painting, sculpture, architecture, and the minor arts are examined in the light of their contributions to the history of civilization, and to the development of art forms.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. ROBERTSON.

78. (II) **RENAISSANCE AND MODERN ART.**—This course is a continuation of Art 77, bringing the historical survey of art down to modern times. While it is advisable to take both courses, either may be elected independently.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mr. ROBERTSON.

Music

As an addition to the courses listed below, the department can make arrangements with thoroughly well-qualified teachers to offer private instruction, without course credit, in voice, piano, organ, violin, and viola.

25. (I) 26. (II) **ELEMENTARY INSTRUMENTAL OR VOCAL ENSEMBLE.**—Admission by permission of instructor. Not open for credit to freshmen, to those taking Music 55 and 56 concurrently, or to those who concurrently are members of organized university musical clubs. This course is designed to improve the playing of instruments and/or the use of the singing voice, and to create further appreciation of music by the most direct of teaching methods—actual performance. Students electing this course should take both 25 and 26.

1 class hour.

Credit, 1.

Mr. ALVIANI, Mr. SCHABAS.

27. (I) 28. (II) **INTERMEDIATE INSTRUMENTAL OR VOCAL ENSEMBLE.**—Not open for credit to those taking Music 55 and 56 concurrently, or to those who concurrently are members of organized university musical clubs. A continuation of Music 26, for the training of performers in small groups, such as string quartet, two piano, and/or mixed vocal octet, female trio, etc. Students electing this course should take both 27 and 28.

1 class hour.

Credit, 1.

Mr. ALVIANI, Mr. SCHABAS.

Prerequisite, Music 26.

29. (I) 30. (II) **ADVANCED INSTRUMENTAL OR VOCAL ENSEMBLE.**—Not open for credit to those taking Music 55 and 56 concurrently, or to those who concurrently are members of organized university musical clubs. This course presents to the student various techniques of solo performance, of program planning, and of teaching beginners in vocal or instrumental music. Those electing this course should take both 29 and 30.

1 class hour.

Credit, 1.

Mr. ALVIANI, Mr. SCHABAS.

Prerequisite, Music 28.

51. (I) and (II) **DISCOVERING MUSIC.**—This elementary course is non-technical in nature and is designed primarily for those students who would like to acquire a general background and knowledge of this great art. With learning to

listen its motive, the course deals with the elements of music, forms in music, musical compositions, and with selected composers. Excerpts from the works of great masters will be used as illustrations.

3 class hours.

Credit, 3.

10:00-10:50 or 11:00-11:50 M. W. F.

Mr. ALVIANI.

52. (I) and (II) GREAT PERIODS OF MUSIC.—This course attempts to transport the student into the spirit of each of several great periods of music—Renaissance, Baroque, Classic, Romantic, and Modern—so that he will feel their quality, understand their enthusiasms, their technical resources and limitations, and their habits of thought and style.

3 class hours.

Credit, 3.

1:00-1:50 or 2:00-2:50 Tu. W. Th.

Mr. SCHABAS.

Prerequisite, Music 51.

55. (I) ADMINISTRATION AND DIRECTION OF CHORAL ORGANIZATIONS.—The aim of this course is to demonstrate the methods of developing school and community choral groups. Conducting techniques are taught and factors of good vocal performance are studied. The student will conduct choral groups during the term. Previous musical experience is desirable.

2 class hours.

Credit, 2.

4:00-4:50 W., one hour by arrangement.

Mr. ALVIANI.

56. (II) ADMINISTRATION AND DIRECTION OF INSTRUMENTAL ORGANIZATION.—The student is introduced to the different types of instrumental music, the problems of balancing instrumentation, and to the functioning of orchestral instruments. Conducting techniques will be practiced before instrumental groups of various sizes. Previous musical experience is desirable.

2 class hours.

Credit, 2.

4:00-4:50 W., one hour by arrangement.

Mr. SCHABAS.

61. (I) GREAT MASTERPIECES OF MUSIC.—The course includes the history and analysis of selected compositions most frequently heard in the concert hall, on records, and on the radio. The selected works will be masterpieces composed during the last two hundred years by the best known composers.

3 class hours.

Credit, 3.

9:00-9:50 M. W.

Mr. SCHABAS.

Prerequisite, Music 51 or 52 or permission of instructor.

62. (I) MUSIC OF THE TWENTIETH CENTURY.—By a study of musical trends, during the twentieth century, this course shows the aims, accomplishments, and future plans of the recent and present day composers. Compositions of this

century are heard and studied as illustrations of the trends which have caused the twentieth century to be called one of unrest and experiment for music.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. ALVIANI.

Prerequisite, Music 51 or 52 or permission of instructor.

75. (I) FUNDAMENTALS OF MUSIC.—This is a correlated study of theory, written and keyboard harmony, ear training, form and analysis. These fundamentals are applied to improve the student's musical appreciation. The course is non-technical in its approach and no previous musical experience is required.

3 class hours.

Credit, 3.

11:00-11:50 Tu., 12:00-12:50 W. Th.

Mr. ALVIANI, Mr. SCHABAS.

76. (I) FUNDAMENTALS OF MUSIC.—A continuation of Music 75. More detailed musical examples are used and further study of the musical fundamentals is made. Primarily, the student will develop more mature consideration of the multifarious musical forms and techniques.

3 class hours.

Credit, 3.

11:00-11:50 Tu., 12:00-12:50 W. Th.

Mr. ALVIANI, Mr. SCHABAS.

Prerequisite, Music 75.

FLORICULTURE

Professor THAYER, Assistant Professor HUBBARD, Assistant Professor ROSS, Mr. DUNHAM.

26. (II) GARDEN MATERIALS.—A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants, and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture, and uses of the various plants are considered as well as identification of materials.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. F.; 3:00-4:50 M.

Mr. DUNHAM.

51. (I) GREENHOUSE MANAGEMENT.—This course is intended to familiarize students with the methods and principles involved in the management of greenhouses and greenhouse crops; history and development of the floricultural industry, preparation of soils, fertilizers, potting, watering, ventilation, control of insects and diseases, methods of plant propagation, forcing of plants, soilless methods of plant culture. At some time during the semester the members of the class will be required to take a one-day trip to visit large commercial establishments at an approximate cost of five dollars.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 3:00-4:50 F. Mr. THAYER, Mr. DUNHAM.

52. (II) FLORAL ARRANGEMENT.—A study of the principles involving the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangements, corsages, wedding bouquets, table decorations, home, church, and other interior decorations. A study of color and color harmony as applied to such work. This course is limited to ten students, preference being given to students specializing in floriculture and landscape architecture.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. Ross.

8:00-8:50 Th.; 1:00-2:50 M. F.

54. (II) GREENHOUSE CONSTRUCTION AND HEATING.—The location, types, arrangement, construction, cost, equipment, heating, and ventilation of greenhouse structures; the drawing of plans and study of specifications. Special emphasis laid on heating problems.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 3:00-4:50 F. Mr. THAYER, Mr. DUNHAM.

58. (II) AMATEUR FLORICULTURE.—This course is intended primarily for major students in the School of Home Economics and for other women students. Three phases of floriculture will be considered: (1) the arrangement and use of cut flowers for decorative purposes in the home and elsewhere, (2) house plants, methods of propagation, (3) garden flowers and their uses on the home grounds.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu.; 1:00-1:50 Th.; 1:00-2:50 W. or 2:00-3:50 Th.

Mr. THAYER, Mr. Ross.

75. (I) 76. (II) COMMERCIAL FLORICULTURE.—A detailed study of the cultural methods for the important commercial cut-flower crops and potted plants. The marketing of flowers and plants, including the management of wholesale markets and retail stores, a study of systems of record keeping, cost analysis, inventory methods, and other phases of this important part of the floricultural industry. Trips may be taken to nearby commercial establishments.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu., Th.; 1:00-2:50 Tu.

Mr. HUBBARD.

Prerequisite, Floriculture 51.

79. (I) CONSERVATORY PLANTS (1950-51).—Alternates with Course 81 for students specializing in floriculture. A study of the foliage and flowering plants used in conservatory work; methods of propagation; identification of materials.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

3:00-3:50 W.; 1:00-2:50 F. Mr. THAYER, Mr. DUNHAM.

81. (I) HERBACEOUS GARDENS AND BORDERS.—Alternates with Course 79 for students specializing in floriculture; given annually for students specializing in landscape architecture.

This course is a continuation of Course 26 with emphasis on the use of herbaceous materials in various types of planting of borders and gardens.

1 class hour; 1 4-hour laboratory period. Credit, 3.
1:00-1:50 Th.; 2:00-4:50 Th., one laboratory hour by arrangement.
Mr. HUBBARD.

Prerequisite, Floriculture 26.

82. (II) SEMINAR.—For seniors specializing in floriculture. Presentation and discussion of research work in floriculture and other related fields.

1 class hour; 4 laboratory hours. Credit, 3.
Mr. THAYER.

FOOD TECHNOLOGY

Professor FELLERS, Assistant Professor LEVINE, Assistant Professor KRANZ, Dr. FITZPATRICK,* Mr. NEBESKY.

51. (I) INTRODUCTORY COURSE.—This is a general elementary course covering food economics, production, distribution and processing. The applications of fundamental science to the food industries are pointed out. The laboratory exercises cover both the theory and practice of canning, freezing and dehydration. The principles of packaging are considered. Fruit and vegetable products are prepared and graded.

1 class hour; 1 4-hour laboratory period. Credit, 3.
8:00-8:50 Tu.; 1:00-4:50 W. or Th. Mr. FELLERS.

52. (II) FOOD PRODUCTS AND ADJUNCTS.—This is a continuation of Course 51. The laboratory work includes pickles and pickle products, maple products, citrus products, fruit syrups, soups, condiments, and the preservation of meats, poultry, and vegetables. The properties and uses of sugars, syrups, brines, enzymes, acids, salt, pectin, preservatives and antioxidants are considered. Experience is given in the use and handling of instruments and equipment. Enrollment is limited to 25.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu. Th.; 1:00-2:50 W. or Th. Mr. FELLERS.

Prerequisite, Food Technology 51.

61. (I) INDUSTRIAL TECHNOLOGY.—A survey of commercial practices in the manufacture and preservation of food products. This will involve a study of equipment, factory arrangement, sanitation, government regulations, and the operation of types of commercial equipment in quantity production.

1 class hour; 1 4-hour laboratory period. Credit, 3.
10:00-10:50 Th.; 1:00-4:50 M. or Tu. Mr. LEVINE.

Prerequisites, Food Technology 52; Bacteriology 31.

* On leave of absence for military service.

62. (II) INDUSTRIAL TECHNOLOGY.—This is a continuation of Course 61. The class exercises will deal largely with a survey study of the sources of raw material, commercial methods of manufacture, packing and distribution of the more common foods. The important contributions of research to food technology will be studied. Laboratory work will include the formation of research projects, interpretation of research data, the use of preservatives, the simple analysis of foods and the commercial practices as applied to preservation of such materials as are available: fish, meats, poultry, and spring vegetables. The inspection and grading of canned food will be studied. Sometime during the semester a two-day field trip to food plants in the Boston area will be taken. The trip will cost the student about fifteen dollars.

1 class hour; 1 4-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. LEVINE.

Prerequisite, Food Technology 61.

71. (I) 72. (II) FOOD SCIENCE LITERATURE.—For seniors who specialize in food technology.

2 class hours.

Credit, 2.

11:00-11:50 M. W.

THE DEPARTMENT.

75. (I) and (II) FOOD PRESERVATION.—For students not majoring in food technology. A survey is made of the causes of food spoilage and of the methods commonly used in preserving foods. The important food products are discussed with emphasis on raw materials used, processing methods and examination of packaged foods. Methods of detecting and preventing spoilage are studied. The laboratory exercises cover the preservation of the major food groups. The theory and use of the pressure cooker are included.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

12:00-12:50 Tu. Th.; 3:00-4:50 M. or Th.

Mr. NEBESKY.

82. (II) CONFECTIONS AND CEREAL PRODUCTS.—The materials offered in this course are as follows: the home manufacture of fruit preserves, candied and glacéed fruits, pastes, confections, candies, and other specialties. Approximately one-half the semester is devoted to elementary work in candy making. This course will also consider the principles of baking, doughs, various cereal products and dry mixes.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 M. F. or 3:00-4:50 M. F.

Mr. LEVINE.

85. (I) 86. (II) MARINE PRODUCTS TECHNOLOGY.—A survey of marine products of commerce and industry. Canning, curing, and freezing of seafoods. Chemical and microbiological aspects of the industry. By-products, industrial problems and scientific literature. Emphasis is placed on the New England fisheries.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

Mr. FELLERS.

91. (I) EXAMINATION OF FOOD PRODUCTS.—Laboratory studies on the grading of foods, examination of foods for adulteration, testing accessory products for quality, and determining the causes of spoilage or deterioration in processed food products. Physical, chemical, microbiological, and microscopical methods will be employed. Enrollment limited to 18.

1 class hour; 1 4-hour laboratory period. Credit, 3.
9:00-9:50 Th.; 1:00-4:50 Th. or F. Mr. FELLERS.

Prerequisites, Food Technology 52; Bacteriology 31; Chemistry 30.

92. (II) EXAMINATION OF FOOD PRODUCTS.—For students specializing in food technology. This is a continuation of Course 91. It includes interpretation of analysis, sanitation and food laws, government grading of processed foods, use of manuals and the technical work of trade associations. Laboratory work includes use of all kinds of laboratory and field equipment and apparatus used in food plants. A separate laboratory section is given for Bacteriology and Public Health majors.

1 class hour; 1 4-hour laboratory period. Credit, 3.
9:00-9:50 Th.; 1:00-4:50 Th. or F.

Mr. FELLERS, Mr. NEBESKY.

Prerequisite, Food Technology 91.

95. (I) and (II) INTRODUCTORY RESEARCH METHODS.—For food technology majors. The application of the fundamental sciences to food technology research.

Hours by arrangement. Credit, 2.

THE DEPARTMENT.

FORESTRY AND WILDLIFE MANAGEMENT

Professor HOLDSWORTH, Professor TRIPPENSEE, Professor RHODES, Associate Professor RICH, Assistant Professor STICKEL, Mr. COLE, Mr. MACCONNELL.

26. (II) DENDROLOGY.—The taxonomic features, silvical characteristics and geographical distribution of the principal forest trees of temperate North America, and the description of the forests in which they occur; identification of the native and naturalized woody plants occurring in the forests of the Northeastern United States, in summer and winter condition, by means of keys and first-hand examination.

2 class hours; 2 2-hour laboratory and field periods.

Credit, 3.
Mr. RHODES.

51. (I) FOREST MANAGEMENT OF WATERSHEDS.—For students majoring in bacteriology and public health. Admission on recommendation of student's major adviser. A study

of forest site—water factor relationships; the improvement of watershed forests through applied silviculture; relative suitability of tree species for watershed uses; forest protection measures.

3 class hours; special field trips.

Credit, 3.

THE DEPARTMENT.

52. (II) FOREST PHOTOGRAMMETRY.—A course designed to familiarize the student with the use of aerial photographs in present-day forest management practice. Map making, forest inventory and other phases of forest management involving the application of photogrammetry are considered in detail. Field trips for checking photographic detail on the ground will be made. Texts and equipment costing about \$22.00 are required.

2 class hours; 1 4-hour laboratory period.

Credit, 3.

Mr. MACCONNELL, Mr. COLE.

53. (I) SILVICS.—Forest ecology as a foundation for silvicultural practice: the physiological basis of forest ecology; environmental factors, their effect upon vegetation, and how they are influenced by it; the development and silvical habits of the individual tree; the development, characteristics and classification of forest communities; plant indicators; methods for the study and analysis of vegetation and its environment.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.

Mr. RHODES.

54. (II) FOREST SOILS.—The structure, development and maintenance of forest soils; their relationship to applied silviculture and forest productivity; the literature of forest soils with special reference to American experience.

3 class hours.

Credit, 3.

Mr. RHODES.

55. (I) THE ELEMENTS OF FOREST MENSURATION.—Methods of determining the volume and value of the forest growing stock; type mapping as it pertains to timber cruising; methods of predicting growth of trees and stands; the field work includes mapping and timber estimating on a forest realistic in size and condition and the submission of an inventory report.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.

Mr. HOLDSWORTH, Mr. COLE.

56. (II) THE PRINCIPLES OF SILVICULTURE.—The methods of establishing and developing forest stands through the application of correct silvicultural practice. Intermediate cuttings and reproduction systems. Field work in applied silviculture,

including the marking of forest stands for silvicultural treatment, is given on University forest property.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Mr. HOLDSWORTH, Mr. RHODES, Mr. STICKEL.

57. (I) FOREST ECONOMICS AND POLICY.—This course considers the forest as a resource yielding direct forest values and social benefits. The history of American forestry and the development of a forest policy together with the role of the forest in American economy are considered. Principles of American forest valuation.

3 class hours.

Credit, 3.

Mr. HOLDSWORTH.

59. (I) FOREST PROTECTION.—The principles of protecting forests from all harmful agencies but with special reference to the prevention and control of forest fires, insects, and disease. Other agencies are treated in accordance with their importance.

3 class hours.

Credit, 3.

Mr. STICKEL.

66. (II) WOOD ANATOMY AND IDENTIFICATION.—A basic anatomical study of wood elements, their various structural characteristics and functions. Relation of structure and properties to use. Microscopic study of wood elements. Practice in identification.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. RICH.

75. (I) MANUFACTURE AND DISTRIBUTION OF FOREST PRODUCTS.—A study of the techniques of manufacturing direct forest products, including production and cost studies; also the seasoning, grading and special processing prerequisite to marketing.

3 class hours.

Credit, 3.

Mr. RICH.

76. (II) WOOD TECHNOLOGY.—The structure, composition and properties of wood in relation to its economic utilization; wood-liquid relationships as they affect seasoning, preservation, and technological processes for industrial purposes. A survey of the technological advances in the use of wood.

3 class hours.

Credit, 3.

Mr. RICH.

78. (II) HARVESTING OF FOREST PRODUCTS.—Methods of harvesting forest products in the several forest regions of the United States with a study of the uses of modern machinery and techniques. Cost control as a factor in the development of harvesting methods and policies.

3 class hours.

Credit, 3.

Mr. RICH.

80. (II) PRINCIPLES OF FOREST MANAGEMENT.—The organization of the forest for sustained yield management with a study of the underlying principles. Forest regulation. The preparation of forest management plans.

2 class hours; 1 4-hour field and laboratory period. Credit, 3.

Mr. MACCONNELL.

81. (I) REGIONAL SILVICULTURE.—The practice of silviculture as applied in the several forest regions of the United States with special reference to the treatment of the tree species of commercial importance. Emphasis is given to the factors, both natural and economic, which govern silviculture in these regions.

3 class hours.

Credit, 3.

Mr. RHODES.

82. (II) SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY.—A study of forest tree seeds and their characteristics, production, harvest, storage, and qualities of germination. The production, distribution, and forest use of planting stock.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. STICKEL.

85. (I) AIR SEASONING AND KILN DRYING.—A study of the proper conditioning of wood products by air seasoning and kiln drying. Laboratory work includes studies of moisture relations in the wood and a study of kiln operation.

3 class hours.

Credit, 3.

Mr. RICH.

Wildlife Management

27. (I) CONSERVATION OF NATURAL RESOURCES.—Natural resources of the United States including soil, water, forests, wildlife, and the important minerals, the historic background of their use and their present status in relation to the social and economic welfare. Includes the discussion of various conservation problems in relation to national prosperity.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. TRIPPENSEE.

70. (II) WILDLIFE MANAGEMENT.—Life histories, ecology, and management of common game birds and mammals. Includes a study of natural habitats and methods of management.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

3:00-4:50 W. F.; lecture by arrangement. Mr. TRIPPENSEE.

71. (I) WILDLIFE MANAGEMENT (1950-51).—Life histories, ecology, and management of waterfowl. Includes a study of natural habitats and method of management. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th.

Mr. TRIPPENSEE.

72. (II) FOREST-ANIMAL RELATIONSHIPS.—Only for students majoring in Forestry. Effects of animals on the forest; the effects of forest practices on wild animal production; economic aspects of forest-animal relationships.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. TRIPPENSEE.

73. (I) WILDLIFE MANAGEMENT.—Life histories, ecology, and management of predaceous birds and injurious mammals. Particularly designed for those who seek employment with rodent control division of Fish and Wildlife Service.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. TRIPPENSEE.

74. (II) TECHNIQUES IN WILDLIFE MANAGEMENT.—Admission by permission of instructor. Quantitative field studies of wild animals of forest and farm. Includes cover mapping, habitat studies, census, food habits, and damage of game animals. For students interested in state and federal employment through civil service.

1 class hour; 1 4-hour laboratory period.

Credit, 3.

1:00-1:50 W.; 1:00-4:50 M.

Mr. TRIPPENSEE.

75. (I) WILDLIFE MANAGEMENT (1949-50).—Life histories, ecology, and management of the furbearers. Includes a study of natural habitats, management and fur farm problems. Given in alternate years.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th.

Mr. TRIPPENSEE.

GEOLOGY AND MINERALOGY

Professor WILSON, Assistant Professor NELSON,

Mr. JOHANSSON, Mr. CASTLE.

27. (I) PHYSICAL GEOLOGY.—An introduction to the agents and processes that modify the earth's crust. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 1:00-2:50 M. Tu. W. Th. or F.

THE DEPARTMENT.

28. (II) HISTORICAL GEOLOGY.—A survey of geological time, stressing the development of continents and the history of plants and animals. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 M. F.; 1:00-2:50 M. Tu. W. Th. or F.

THE DEPARTMENT.

50. (I) ENGINEERING GEOLOGY.—A general course in engineering geology stressing earth structure, the dynamic processes, and agents of weathering. The laboratory work consists

of mineral and rock-determination and map-reading as related to the phenomena of physical geology.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. CASTLE.

51. (I) MINERALOGY.—A descriptive study. Stress is placed upon the identification and occurrence of minerals. 1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 M. F. Mr. NELSON.

52. (II) PETROLOGY.—A descriptive study of the classes of rocks with reference to manner of origin, modes of occurrence, structural features and the chemical and petrographic distinction within each group.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 M. F. Mr. NELSON.

54. (II) ECONOMIC GEOLOGY.—A course dealing with the origin, classification, and uses of metallic and non-metallic mineral deposits.

3 class hours. Credit, 3.
Mr. NELSON.

Prerequisites, Geology 27; Chemistry 1 and 2.

61. (I) PHYSIOGRAPHY AND REGIONAL GEOLOGY—EASTERN UNITED STATES (1950-51).—A systematic study of the topography and geological features of the eastern United States. Field trips by arrangement. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. WILSON.

62. (II) PHYSIOGRAPHY AND REGIONAL GEOLOGY—WESTERN UNITED STATES (1950-51).—A systematic study of the topography and geological features of the western United States. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. WILSON.

63. (I) INVERTEBRATE PALEONTOLOGY.—A study of the history, development and identification of invertebrate animal fossils. Field trips by arrangement.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
11:00-11:50 W.; 10:00-11:50 M. F. Mr. JOHANSSON.

64. (II) PLANT PALEONTOLOGY.—A study of the history, development, and identification of plant fossils. Field trips by arrangement.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
11:00-11:50 W.; 10:00-11:50 M. F. Mr. WILSON.

71. (I) 72. (II) SPECIAL PROBLEMS.—For seniors specializing in geology.

6 laboratory hours. Credit, 3.
Hours by arrangement. Mr. WILSON, Mr. NELSON.

GERMAN

Professor JULIAN, Professor GRAHAM,* Associate Professor ELLERT, Assistant Professor ASCHER,* Mr. TIBBETTS, Mr. STAWIECKI, Mr. THOMAS.

1. (I) 2. (II) **ELEMENTARY GERMAN.**—Grammar, prose composition, and reading. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours.

Credit, 3.

THE DEPARTMENT.

5. (I) 6. (II) **ADVANCED GERMAN PROSE.**—Reading of representative German authors. Grammar review.

3 class hours.

Credit, 3.

8:00-8:50 Tu. Th. S.

Mr. STAWIECKI.

Prerequisite, Entrance German.

25. (I) 26. (II) **INTERMEDIATE GERMAN.**—German prose and poetry; the simpler German drama; grammar review and advanced prose composition. Simpler passages of prose and poetry to commit to memory.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, German 1 and 2.

51. (I) 52. (II) **NINETEENTH CENTURY LITERATURE.**—A survey of German thought in the Nineteenth Century.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. ELLERT.

Prerequisites, German 25 and 26.

55. (I) 56. (II) **"STORM AND STRESS" AND ROMANTICISM.**—The "Storm and Stress" period of German literature, with study of the early plays of Goethe and Schiller. The Romantic period from Novalis to Heine, with study of poets, prose writers, critics, and philosophers.

3 class hours.

Credit, 3.

Mr. ELLERT.

Prerequisites, German 25 and 26.

57. (I) 58. (II) **GOETHE'S FAUST.**

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. JULIAN.

Prerequisites, German 25 and 26.

59. (I) 60. (II) **THE CLASSICAL PERIOD.**—Reading and study of some important literary productions of the classical period.

3 class hours.

Credit, 3.

8:00-8:50 Tu Th. S.

Mr. ELLERT.

Prerequisites, German 25 and 26.

* Visiting Professor.

79. (I) 80. (II) CONVERSATIONAL GERMAN.—Admission only by arrangement with the head of the department. Practice in the oral use of German, based on reading material prepared in advance.

3 class hours.

Credit, 3.

Hours by arrangement.

Miss ASCHER.

Prerequisites, German 25 and 26.

81. (I) 82. (II) SCIENTIFIC GERMAN.—Only seniors admitted, except by permission of the instructor. Intensive and specialized reading of literature taken from standard German scientific journals and reference books.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. JULIAN.

Prerequisites, German 25 and 26.

HISTORY

Professor CALDWELL, Professor CARY, Assistant Professor PIERCE, Assistant Professor DAVIS, Mr. ZEENDER, Miss BOAS, Mr. CARNES.

5. (I) 6. (II) MODERN EUROPEAN CIVILIZATION.—The first semester covers the period from the later Middle Ages to 1815; the second semester, the period from 1815 to the present. These courses are required for candidates for the B.A. degree but may be elected independently by other students.

3 class hours.

Credit, 3.

THE DEPARTMENT.

31. (I) 32. (II) ENGLISH HISTORY.—Emphasis on economic, social, and cultural influences, as well as on constitutional development. Either semester may be elected independently.

3 class hours.

Credit, 3.

Mr. CALDWELL, Mr. CARNES.

53. (I) INTERNATIONAL RELATIONS.—A course dealing with the development and practices of international relations, the diplomatic and consular services of states, the nature of nationalism and imperialism, the basic factors determining a nation's foreign policy, and the earlier evolution toward supranational government.

3 class hours.

Credit, 3.

Mr. PIERCE.

54. (II) THE FAR EAST IN MODERN TIMES (1950-51).—After a brief and selective survey of earlier Oriental history and culture the emphasis is upon India, China, and Japan since the impact of western technology. Considerable attention is paid to contemporary political, economic, and diplomatic problems. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PIERCE.

56. (II) THE HISTORY OF MODERN RUSSIA (1949-50).—This course is a study of Russia in both Europe and Asia since 1800. The major topics considered are: Tsarist government and society; diplomacy and expansion; political, intellectual, and economic unrest; reforms and the Duma; World War I and the Communist Revolution; recognition and experimentation; World War II; the U.S.S.R. as an Eurasian World Power. Given in alternate years.

3 class hours.

Credit, 3.

Mr. PIERCE.

Prerequisite, History 6 or permission of instructor.

57. (I) 58. (II) HISPANIC-AMERICAN HISTORY.—A general course in the history and civilization of the Americas south of the United States. The first semester deals with the periods of exploration, organization, and revolution to 1824; the second semester, with the period of national independence and growth from 1824 to the present. Either semester may be elected independently.

3 class hours.

Credit, 3.

Mr. PIERCE.

59. (I) 60. (II) HISTORY OF THE UNITED STATES.—A survey of the national development including political, social, economic, and cultural factors in the growth of American democracy. The first semester covers the period to 1865; the second, from 1865 to the present. Either semester may be elected independently.

3 class hours.

Credit, 3.

Mr. CARY.

61. (I) ANCIENT GREEK HISTORY (1950-51).—Given in alternate years.

3 class hours.

Credit, 3.

Mr. DAVIS.

63. (I) ANCIENT ROMAN HISTORY (1949-50).—Given in alternate years.

3 class hours.

Credit, 3.

Mr. DAVIS.

65. (I) NINETEENTH AND TWENTIETH CENTURY ENGLAND (1949-50).—Victorian society and ideals; Industrial Revolution and its effects; growth of democracy; imperial development. Emphasis on social conditions and thought movements. Given in alternate years.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 32.

67. (I) TUDOR AND STUART ENGLAND (1950-51).—A brief survey of the Tudor Period followed by a detailed study of

Early Stuart England. Particular emphasis is placed on social, religious, and intellectual aspects of English life in the period. Given in alternate years.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 31 or 32.

69. (I) EUROPE, 1870-1918.—Internal developments of the principal countries, including political and economic changes, social unrest, and intellectual currents; the development of imperialism; a detailed study of conditions and diplomacy which led to the World War; military history of the War.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 6.

70. (II) EUROPE SINCE 1918.—A continuation of History 69, but may be elected independently. Approximately half of the course is devoted to international affairs, including the Peace Settlement, the development of German, Italian, and Japanese aggression, and World War II. The other half of the course is a study of internal developments in the principal European nations.

3 class hours.

Credit, 3.

Mr. CALDWELL.

Prerequisite, History 6, or permission of the instructor.

72. (II) HISTORY OF AMERICAN WESTWARD EXPANSION, 1763-1893.—Advance of settlement from the Appalachians to the Pacific and influence of the frontier upon social, economic, and political conditions in the country as a whole.

3 class hours.

Credit, 3.

Mr. DAVIS.

Prerequisite, History 59.

75. (I) MEDIEVAL EUROPE.—Europe from the barbarian invasions to the Renaissance. Social and economic conditions, development of national monarchies, the Church and religion, medieval culture.

3 class hours.

Credit, 3.

Mr. ZEENDER.

76. (II) HISTORY OF THE RENAISSANCE.—The later Middle Ages; the Church at the height of power; the rise of nationalities; the Italian towns; the New Learning and its relation to art, science, invention, geographical discoveries; spread and effects of the Renaissance.

3 class hours.

Credit, 3.

Mr. ZEENDER.

81. (I) DIPLOMATIC HISTORY OF THE UNITED STATES. 1776-1900.—The history of American foreign policy and its basic factors to the end of the nineteenth century.
3 class hours.

Credit, 3.
Mr. CARY.

Prerequisites, History 59 and 60 or permission of instructor.

82. (II) DIPLOMATIC HISTORY OF THE UNITED STATES SINCE 1900.—The history of the United States as a world power.
3 class hours.

Credit, 3.
Mr. CARY.

Prerequisites, History 59 and 60 or permission of instructor.

91. (I) HISTORICAL BIBLIOGRAPHY.—Training in assembling a bibliography and an introduction to the works of some leading historians.
1 class hour.

Credit, 1.
Mr. CARY.

92. (II) SEMINAR.—Instruction in the evaluation of source materials and the preparation of reports.
1 class hour.

Credit, 1.
Mr. CARY.

HOME ECONOMICS

Professor MITCHELL, Assistant Professor BRIGGS, Assistant Professor MERRIAM, Assistant Professor COOK, Assistant Professor PIATT, Assistant Professor JANÉ, Miss DAVIS, Mrs. THIES, Mrs. WILHELM.

1. (I) INTRODUCTION TO HOME ECONOMICS.—The course introduces the student to the objectives in Home Economics and the fields of specialization for which it prepares. Consideration is given to a philosophy of living which emphasizes the responsibility of a woman to her family, to her community wherever she is, and to the world. Introductory work is offered in food and nutrition, child development and family life. Laboratory work includes food selection and simple preparation, and observation in the Nursery School.

2 class hours; 1 2-hour laboratory period.
8:00-9:50 Tu. Th. S. reserved for special group projects.

Credit, 3.
Mrs. PIATT.

2. (II) CLOTHING SELECTION.—A study of the principles of clothing selection in order to assist each student to choose satisfactorily line, color, and texture. Fundamentals of construction for cotton and linen.

1 class hour; 2 2-hour laboratory periods.
Credit, 3.
Mrs. WILHELM.

26. (II) TEXTILES.—A study of fiber, yarn, finish, color and design. Acquaintance with a wide variety of fabrics is

afforded to develop judgment in buying and using materials for clothing and home furnishing.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss BRIGGS.

30. (II) FOOD SCIENCE AND PREPARATION.—A study of the fundamental scientific principles and comparative methods of food preparation, including home preservation. The nutritional and economic aspects of foods are also stressed.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Miss DAVIS.

31. (I) APPLIED ART.—Art principles are studied with many practical applications for selecting and arranging. Specific problems in decorating cloth, wood, and leather afford opportunity for individual expression.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss BRIGGS.

51. (I) FOOD SELECTION AND MEAL PLANNING.—Meal planning, serving and etiquette with emphasis on well-balanced meals as to nutritive value and economy of money, time, and labor in preparation. Further study of food principles and techniques of cookery.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Miss DAVIS.

Prerequisite, Home Economics 30; Chemistry 31 and 32.

52. (II) NUTRITION AND DIETETICS.—A study of the fundamentals of normal nutrition including energy needs, the metabolism of proteins, carbohydrates, fats, vitamins, and minerals; and the quantitative requirements for these various essential nutrients. Laboratory work provides for further study of the composition of foods and their contribution to the diet and the relationship of the nutritive value to cost. Nutritive loss due to cooking, storage, etc. is given consideration.

3 class hours; 1 2-hour laboratory period. Credit, 3.
Mrs. Cook.

Prerequisites, Home Economics 30; Chemistry 31 and 32 or Zoology 35.

54. (II) NUTRITION.—For students who are not majoring in Home Economics and who do not have prerequisites for Home Economics 52. This course is designed to interpret the technical knowledge of foods and nutrition in terms of its practical application for optimum health.

2 class hours. Credit, 2.
Mrs. Cook.

56. (II) FOOD PREPARATION AND MEAL PLANNING.—For students not majoring in home economics. This course is designed to meet the needs of those who wish a general

knowledge of the basic food principles. It will include latest methods and techniques of cookery, conservation of nutrients, menu planning and food preparation, buying of food, consumer education and table service, decoration and etiquette. It is recommended for students who want a scientific as well as practical knowledge of food and its preparation for everyday use.

2 class hours; 1 3-hour laboratory period.

Credit, 3.
Miss DAVIS.

57. (I) CLOTHING SELECTION AND SIMPLE CONSTRUCTION.—For students not majoring in home economics. This course is designed to stimulate an interest in good workmanship. Emphasis is given to construction technique such as fitting, pattern use and altering.

1 class hour; 1 3-hour laboratory period.

Credit, 2.
Mrs. WILHELM.

60. (II) HOUSEHOLD EQUIPMENT AND DEMONSTRATION TECHNIQUES.—Selection, care and operation of household equipment and the study of the mechanical principles involved. Student demonstrations given for practice with all types of equipment. Study of home lighting and wiring. Outside demonstrations and field trips are planned.

2 class hours; 1 2-hour laboratory period.

Credit, 3.
Miss MERRIAM.

61. (I) CLOTHING DESIGN AND CONSTRUCTION.—Principles of construction are given through the use of commercial patterns and handling of wool fabrics. Flat pattern design is stressed with each student making her own design in silk or rayon.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.
Mrs. WILHELM.

Prerequisite, Home Economics 2 or 57 or equivalent.

62. (II) HOME FURNISHING.—A study of the fundamental principles which underlie the successful planning and furnishing of a satisfying home. A study of period homes and furnishings is included. Many applications of these principles are worked out in practical problems.

1 class hour; 2 2-hour laboratory periods.
11:00-11:50 W.; 1:00-2:50 M. F.

Credit, 3.
Miss BRIGGS.

70. (II) CHILD DEVELOPMENT.—The growth and development of the child, his basic needs, aspects and behavior—routine, creative and social—as they are related to personality development. Planned observation and participation in nursery work.

3 class hours; 1 1-hour laboratory period.

Credit, 3.
Mrs. THIES.

71. (I) RETAIL FOOD BUYING.—This course is offered jointly by the departments of olericulture, animal husbandry,

and poultry husbandry for all students interested in retail marketing. First 5 weeks: vegetables and fruits, retail buying, varieties and adaptability to various uses, season of availability, grades, packs and packages. Second 5 weeks: poultry and eggs—dressed poultry is graded and prepared in various ways for the table and home freezing. Demonstrations are given of handling and market classification of eggs. Third 5 weeks: meats—demonstration and laboratory practices in identification and classification of meat cuts, in preservation (freezing and curing) and in judging quality.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu. Th.; 3:00-4:50 Th.

Mr. SNYDER, Mr. VONDELL, Mr. HALE.
Miss JANÉ, coordinator.

75. (I) ECONOMICS OF THE HOUSEHOLD.—A study of personal and family standards of living in the modern home, the economic relations of the household, and the use of time, energy, and money as a means to influence the home situation.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Miss MERRIAM.

77. (I) and (II) HOME MANAGEMENT PRACTICE.—Successive groups of seniors live in the home management house and assume responsibilities involved in managing a home. Meals are planned on low, medium, and high income levels.

Credit, 3.
Miss MERRIAM.

Prerequisites, Home Economics 51, 52, and 75, or by special permission.

80. (II) FAMILY LIFE.—A study of the modern family; ideals and responsibilities of the home and the individual's share in developing positive family relationships.

3 class hours. Credit, 3.
9:00-9:50 M. W. F. Mrs. PIATT.

81. (I) METHODS OF TEACHING HOME ECONOMICS.—A study of general education philosophy; the application of home economics to the entire school program; development of curricula based upon student needs; exploration of instructional methods and techniques. This course gives credit toward meeting state standards for teachers.

3 class hours. Credit, 3.
Mrs. PIATT.

83. (I) and (II) STUDENT TEACHING IN HOME ECONOMICS.—Observation and supervised teaching are carried on in the home economics classes in the nearby junior and senior high schools.

Credit, 3.
Miss MERRIAM, Mrs. PIATT.
Prerequisite, Home Economics 81 or its equivalent.

85. (I) **THEORY AND PRACTICE OF NURSING SCHOOL-MANAGEMENT.**—This course is planned to give students a background in the history and philosophy of the pre-school program; theory and techniques of nursery school practice; children's activities in music, art, literature, and science; fundamentals of play and use of play materials, and methods of observation and recording. Supervised participation in child development laboratory as well as field trips to observe special groups.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mrs. THIES.

Prerequisite, Home Economics 70.

86. (II) **CHILD DEVELOPMENT.**—The growth and development of the child, his basic needs, aspects of behavior—routine, creative, and social—as they are related to personality development. Planned observation and participation in Nursery School.

3 class hours; 1 hour laboratory.

Credit, 3.

8:00-8:50 M. W. F.

Mrs. THIES.

87. (I) **PRINCIPLES AND PRACTICES OF TAILORING.**—Emphasis on handling of wool in the making of suits and coats. 1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Miss BRIGGS.

Prerequisite, Home Economics 61 or equivalent.

88. (II) **APPLIED DRESS DESIGN.**—Costume design by drawing and draping, using textures of unusual nature. Emphasis will be placed on fitting and adapting design to the figure.

3 2-hour laboratory periods.

Credit, 3.

Miss BRIGGS.

Prerequisite, Home Economics 87 or equivalent.

89. (I) **DIET THERAPY.**—The application of nutrition principles to diet in disease. Recent theories of dietary treatment of gastro-intestinal disorders, obesity, anemia, fevers, diabetes, food allergy, cardiovascular and biliary tract diseases are reviewed critically. Students are required to use and be familiar with current medical literature as it applies to nutritional problems in disease and at the same time be open-minded regarding new development in this field. Scientific and medical terminology is emphasized.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mrs. Cook.

Prerequisites, Home Economics 52; Chemistry 79; Zoology 35.

90. (II) **NUTRITION SEMINAR.**—For qualified seniors. Reading and oral reports of scientific literature and preparation of bibliographies.

1 class hour.

Credit, 1.

Mrs. Cook.

91. (I) 92. (II) INSTITUTIONAL FOODS AND MANAGEMENT.

—For qualified juniors or seniors interested in institutional food service. A study of the principles of organization, personnel management, the administration, food costs, operating expenses, and the special functions of the dietitian. Laboratory work at one of the university dining halls. It is expected that students will enroll for the work of both semesters. Students wishing to qualify for administrative institutional work are advised to take Accounting 25.

1 class hour; 1 5-hour laboratory period.

Credit, 3.
Miss JANÉ.

Prerequisite, Home Economics 51 and 52.

93. (I) EXPERIMENTAL FOODS.—The testing and comparing of different food materials and methods of preparation, including advanced work in the science and techniques of cookery. Special individual problems will be studied. The course is helpful to those interested in commercial food testing and valuable to those wishing to develop a scientific approach to the study of foods.

2 class hours; 1 3-hour laboratory period.

Credit, 3.
Miss DAVIS.

Prerequisites, Home Economics 30 and permission of instructor.

95. (I) CHILD NUTRITION.—A study is made of nutritional needs from prenatal life through infancy and childhood. Methods of judging nutrition, also causes and effects of malnutrition are discussed. Menus for children and measures to insure the consumption of optimal diets are put into practice with laboratory work in the Nursery School.

3 class hours. Laboratory by arrangement.

Credit, 3.
Mrs. COOK.

Prerequisite, Home Economics 52 or 54.

98. (I) and (II) PROBLEMS IN HOME ECONOMICS.—An intensive study of some phase of home economics. By permission of the Dean of the School.

Credit, 3.
HOME ECONOMICS STAFF.

HYGIENE

HYGIENE.—All freshmen are required to attend a series of lectures on personal hygiene. For men students these lectures are included in the Military program; for women students they are scheduled as a separate course.

Credit, 1.
THE HEALTH SERVICE STAFF.

JOURNALISM

Professor MUSGRAVE.

85. (I) PRINCIPLES OF JOURNALISM.—A basic course in reporting designed to acquaint the student with the scope, principles, and practice of contemporary journalism. Stress

is placed upon the role of the press as a social institution and upon the relationships between a general education and effective journalism.

3 class hours.

Credit, 3.

Mr. MUSGRAVE.

86. (II) JOURNALISTIC TECHNIQUES.—Instruction in writing certain types of news stories, feature and magazine articles. The practice work is related to problems of interpretative writing, communication, and public opinion. Each student is expected to publish a feature article in a newspaper or magazine.

3 class hours.

Credit, 3.

Mr. MUSGRAVE.

Prerequisite, Journalism 85 or permission of the instructor.

LANDSCAPE ARCHITECTURE

Professor OTTO, Professor BLUNDELL, Assistant Professor ROBERTSON, Mr. PROCOPIO, Mr. MACIVER, Mr. DURELL.

Landscape Architecture

25. (I) FREEHAND DRAWING AND ELEMENTARY DESIGN.—For majors in landscape architecture. The work in this course is to supply the student with technical aspects of freehand drawing and design necessary to proficiency in that field.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. MACIVER.

26. (II) LANDSCAPE DRAFTING.—This course continues the work in Landscape Architecture 25, but draws on the mechanical aspects of the designers problems and includes simple projections—orthographic, perspective, and isometric—and architectural shades and shadows.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. MACIVER.

51. (I) ELEMENTS OF TOPOGRAPHY AND CONSTRUCTION.—Contour interpolation, grading and drainage plans, drive design, profiles and sections, computation of earth work. Application of surveying to landscape construction.

3 2-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. PROCOPIO.

Prerequisites, Civil Engineering 27; Landscape Architecture 26.

52. (II) CONSTRUCTION DETAILS.—A series of problems in architectural garden features as walks, steps, walls, gates, pools, and small structures.

2 3-hour laboratory periods.

Credit, 3.

1:00-2:50 M. W. F.

Mr. PROCOPIO.

Prerequisite, Landscape Architecture 51.

53. (I) GARDEN DESIGN.—Fundamental principles of composition with application to problems in the design of gardens and small home grounds.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. OTTO.

Prerequisites, Landscape Architecture 25 and 26 or permission of the instructor.

54. (II) GENERAL DESIGN.—A series of problems in the design of small properties, estates and parks. Members of this class will be required to take a two-day field trip to visit typical examples of design; approximate cost, \$8.00.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. OTTO.

Prerequisites, Landscape Architecture 51, 53, and concurrently 52.

76. (II) CIVIC ART.—A survey of the principles and applications of modern civic art, including city planning, regional planning and the design of various types of land areas.

3 2-hour laboratory periods.

Credit, 3.

Mr. OTTO.

Prerequisites, Landscape Architecture 51 and 52.

79. (I) CONSTRUCTION AND MAINTENANCE (1949-50).—A study of construction methods and the maintenance of estate, park, and recreation areas. Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. PROCOPIO.

80. (II) HISTORY AND LITERATURE OF LANDSCAPE ARCHITECTURE.—A review of the significant history and literature of landscape architecture and the allied fields of city planning, regional planning and highway improvement. Compilation of bibliographies on various phases of these fields.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. DURELL.

81. (I) 82. (II) ADVANCED DESIGN.—Class B Exchange Problems plus specialized study of landscape details and a summary of general design. Members of the class may be required to take a two-day field trip to visit typical examples of design; approximate cost, \$10.00.

3 2-hour laboratory periods.

Credit, 3.

3:00-4:50 M. W. F.

Mr. DURELL.

Prerequisites, Landscape Architecture 53 and 54.

83. (I) ARCHITECTURE (1950-51).—The history of architectural development, including styles of architecture and construction principles of value to the landscape architects when working with architectural problems. Given in alternate years.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. ROBERTSON.

84. (II) SKETCHING.—Drawing and sketching in various mediums from outdoor and indoor subjects.

2 2-hour laboratory periods.

Credit, 2.

1:00-2:50 M. F.

Mr. ROBERTSON.

Horticulture

1. (I) PLANT PROPAGATION.—This course serves as an introduction to the field of horticulture, emphasizing the methods and principles involved in the propagation of horticultural plants.

3 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. THAYER, Mr. PROCOPIO.

26. (II) PLANT MATERIALS.—Detailed study of deciduous and evergreen trees, with special reference to their mature form and character, means of identification, natural associations, and uses of the various types of trees in landscape work.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. BLUNDELL.

51. (I) PLANT MATERIALS.—Detailed study of shrubs and woody vines, and their identification, with especial emphasis being given to their adaptability to the various landscape uses, methods of handling, and care.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. BLUNDELL.

52. (II) PLANTING DESIGN.—A study of the utilization of plant materials in combination as applied to the many conditions and demands of landscape work.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. BLUNDELL.

Prerequisites, Horticulture 26 and 51.

LATIN

Miss ROGERS.

51. (I) 52. (II) LATIN.—A course in elementary Latin. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours.

Credit, 3.

Miss ROGERS.

55. (I) 56. (II) LATIN.—A college survey of classical Latin literature: epic (Virgil), lyric (Catullus and Horace), comedy (Plautus), oratory (Cicero), and philosophy (Lucretius). The list may be varied according to the needs of particular classes.

3 class hours.

Credit, 3.

Miss ROGERS.

Prerequisites, Latin 51, 52 or 2 years of high school Latin.

MATHEMATICS

Professor ANDERSEN, Professor MACHMER, Associate Professor BOUTELLE, Assistant Professor SCHOONMAKER, Assistant Professor ROSE, Assistant Professor CULLEN, Mr. BUZZELL, Mr. SKILLINGS, Mr. RITGER, Mr. ALLEN, Mr. MIENTKA, Mr. MOSER.

5. (I) INTRODUCTORY ENGINEERING MATHEMATICS.—Trigonometry and algebra: a rapid basic review, theory of equations, simple determinants and the slide rule. Plane analytic geometry: the straight line, conic sections, selected higher plane curves, polar coordinates and parametric equations.
4 class hours.

Credit, 4.

THE DEPARTMENT.

6. (II) INTRODUCTORY CALCULUS FOR ENGINEERS.—Differentiation, with applications, technique of integration.
4 class hours.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 5.

7. (I) ALGEBRA AND TRIGONOMETRY.—For all freshmen, except majors in Engineering, who are required to take a full year of college mathematics. Fractions, quadratic equations, exponents, logarithms, variation, determinants of the second and third orders, and plane trigonometry.
3 class hours.

Credit, 3.

THE DEPARTMENT.

8. (II) ALGEBRA.—This course is designed for the freshmen who do not plan to proceed to Calculus. Theory of equations, progressions, mensuration, number systems, and the elements of statistics and mathematics of investments.
3 class hours.

Credit, 3.

THE DEPARTMENT.

10. (II) ALGEBRA AND ANALYTIC GEOMETRY.—This course is designed for the freshmen who plan to take Calculus. Theory of equations, binomial theorem, determinants of higher order, and plane analytic geometry.
3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 7.

12. (II) FUNCTIONAL MATHEMATICS.—For freshmen who are not required to take a full year of college mathematics. Fractions, percentage, linear and quadratic equations with applications, exponents, logarithms, slide rule, proportion, graphs, statistics, progressions, and the elements of mathematics of investments.
3 class hours.

Credit, 3.

Mr. SCHOONMAKER, Mr. ALLEN.

27. (I) PLANE ANALYTIC GEOMETRY.—This course is designed for those who have had Mathematics 7 and 8 or

their equivalents and who wish to prepare for later work in the calculus.

3 class hours.

Credit, 3.

Prerequisite, Mathematics 8.

THE DEPARTMENT.

29. (I) DIFFERENTIAL CALCULUS.—The basic ideas and methods of the differential calculus.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 10 or 27.

30. (II) INTEGRAL CALCULUS.—A continuation of Mathematics 29 into the field of the integral calculus, with special emphasis on application to problems.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 29.

31. (I) APPLIED CALCULUS FOR ENGINEERS.—Area, volume, length of curve, centroid, moment of inertia, liquid pressure, work, partial differentiation.

4 class hours.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 6.

32. (II) APPLIED CALCULUS FOR ENGINEERS.—Multiple integrals, infinite series, expansion of functions, hyperbolic functions, differential equations, elements of vector analysis.

4 class hours.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 31.

51. (I) MODERN SYNTHETIC GEOMETRY.—An extension of the geometry of the triangle and the circle. The course is intended especially for those planning to be high school teachers.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisite, Mathematics 30.

55. (I) MATHEMATICS OF FINANCE.—The mathematical principles of simple and compound interest, annuities, depreciation, valuation of bonds, insurance. The development and application of aids to computation in problems arising from financial transactions.

3 class hours.

Credit, 3.

10:00-10:50 Tu. S.; 11:00-11:50 Th.

Mr. BOUTELLE.

Prerequisite, Mathematics 7.

60. (II) SPHERICAL TRIGONOMETRY AND SOLID ANALYTIC GEOMETRY (1949-50).—The trigonometry of the sphere with application to terrestrial and celestial problems. This is followed by a study of higher plane curves and the analytic

representation of points, lines, and surfaces in space. Given in alternate years.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 30.

62. (II) STATISTICS. — The fundamental mathematical principles of statistical analysis. The derivation of the basic formulas used, and the study and discussion of such topics as averages, dispersion, skewness, curve fitting, least squares, linear and curvilinear correlation, probability curve, probable error, sampling, reliability.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 10 or 27.

65. (I) THEORY OF EQUATIONS (1949-50). — An introduction to advanced algebra. A discussion of the conditions for and methods of solving algebraic and transcendental equations; ruler and compass constructions; systems of equations; determinants and matrices; symmetric functions; resultants; discriminants; invariants; the fundamental theorem of algebra. Given in alternate years.

3 class hours.

Credit, 3.

Mr. BOUTELLE.

Prerequisite, Mathematics 10 or 27.

66. (II) INTRODUCTION TO HIGHER GEOMETRY (1949-50). — A study of various methods employed in the modern treatment of the geometry of points, lines, and conics. Such topics as homogeneous point and line coordinates; infinite elements; harmonic division; groups of transformations and their invariants; and the elements of projective and other geometrics, will be considered. Given in alternate years.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisite, Mathematics 10 or 27.

71. (I) VECTOR ANALYSIS (1950-51). — The algebra and calculus of vectors. Applications to physics and other fields will be considered. Given in alternate years.

3 class hours.

Credit, 3.

Mr. ANDERSEN.

Prerequisites, Mathematics 30; Physics 26.

72. (II) HISTORY OF MATHEMATICS (1950-51). — A study of mathematics as it has developed historically. Topics considered include classical problems and concepts of mathematics and the lives and times of the great mathematicians. This course is recommended especially for prospective high school teachers. Given in alternate years.

3 class hours.

Credit, 3.

Mr. ROSE.

Prerequisite, Mathematics 30.

91. (I) **ADVANCED CALCULUS.**—Series, expansion of functions, partial differentiation, envelopes, and multiple integrals.
3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 30.

92. (II) **DIFFERENTIAL EQUATIONS.**—

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 30.

94. (II) **ADVANCED CALCULUS.**—A continuation of Mathematics 91. Line and surface integrals; Taylor's expansion; Fourier series; calculus of variations; Elliptic, Gamma, and Beta functions; continuity theorems.

3 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 91.

Astronomy and Meteorology

57. (I) **METEOROLOGY.**—A consideration of weather elements, air masses, frontal structures and storms, the construction and interpretation of weather maps and the general principles of weather forecasting.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. LANPHEAR.

58. (II) **ASTRONOMY.**—The course deals with a consideration of the atmosphere through which astronomical phenomena are observed; fundamental conceptions of the celestial sphere, the solar system, stars, galaxies. The chief objective is to make the student alive to the beauty and order revealed in the sky.

2 class hours.

Credit, 2.

8:00-8:50 Tu. Th.

Mr. LANPHEAR.

MILITARY

Colonel TODD, PMS&T, Lieutenant Colonel DEHORN, PAS&T, Lieutenant Colonel ADAMS, Assistant PMS&T, Major HALE, Assistant PAS&T, Major KABRUD, Assistant PAS&T, Major VOEGELI, Assistant PMS&T, Captain SEARLE, Assistant PAS&T.

1. (I) 2. (II) Theoretical and practical instruction in leadership, drill and exercise of command, individual weapons and marksmanship, hygiene and first aid, maps and aerial photographs, military organization, and the National Defense Act, ROTC regulations.

3 scheduled hours.

First semester, Credit, 3.

Second semester, Credit, 2.

ARMY INSTRUCTORS.

25. (I) 26. (II) Theoretical and practical instruction in leadership, drill and exercise of command, physical development methods, maps, and aerial photographs, military administration, evolution of warfare, military law and boards.
3 scheduled hours.

Credit, 2.

ARMY INSTRUCTORS.

51. (I) 52. (II) Theoretical and practical instruction in leadership, drill and exercise of command, military leadership, psychology and personnel management, Geographical foundation of national power, and military law and boards; tactics and technique of cavalry or armored units for students in the armored cavalry unit; tactics and techniques of the Army Air Forces for students in the air corps unit.

5 scheduled hours.

Credit, 3.

ARMY INSTRUCTORS.

75. (I) 76. (II) Theoretical and practical instruction in leadership, drill and exercise of command, military teaching methods, military problems of the United States, psychological warfare, military mobilization and demobilization, command and staff operations; tactics and technique of cavalry or armored units for students in the armored cavalry unit; tactics and techniques of the Army Air Forces for students in the air corps unit.

5 scheduled hours.

Credit, 3.

ARMY INSTRUCTORS.

OLERICULTURE

Professor SNYDER, Assistant Professor TUTTLE, Mr. JOHNSON.

25. (I) GENERAL OLERICULTURE.—A study of the factors affecting the growth of plants which are essential to a basic understanding of the cultural requirements of vegetable and other horticultural crops.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. SNYDER, Mr. JOHNSON.

51. (I) PLANT NUTRITION.—A critical study of the water and nutrient requirement of vegetable plants as applied to irrigation, soils and their preparation, manures, fertilizers, lime, green manures and crop residues.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. TUTTLE.

52. (II) PLANT CULTURE.—A study of certain environmental factors which influence the culture of vegetables as applied to actual commercial practices.

3 class hours.

Credit, 3.

8:00-8:50 M. W. F.

Mr. JOHNSON.

73. (I) VEGETABLE MARKETING PRACTICES.—A consideration of the various factors, techniques, and methods in harvesting and preparing vegetables for market, including marketing

centers, production areas, market and consumer preference, packing house facilities and equipment, and premarket storage. Trips to nearby growers and markets will be required at a cost of not over ten dollars.

3 class hours.

10:00-10:50 M. W. F.

Prerequisite, Agricultural Economics 55.

Credit, 3.

Mr. SNYDER.

74. (II) **MERCHANDISING OF PERISHABLES.**—Discussion and demonstrations in this course will include the various techniques, practices, and methods that are used in selling and distributing horticultural commodities through both wholesale and retail outlets from the farm to the ultimate consumer. Trips to the Boston and New York markets may be elected by the student at a reasonable cost.

3 class hours.

10:00-10:50 M. W. F.

Credit, 3.

Mr. SNYDER.

75. (I) **SYSTEMATIC OLERICULTURE.**—A detailed study of variety identification; nomenclature and classification; history, variety improvement and seed sources; judging and exhibiting. 1 class hour; 2 2-hour laboratory periods.

Hours by arrangement.

Credit, 3.

Mr. SNYDER.

76. (II) **GREENHOUSE CROPS AND PLANT GROWING (1950-51).**—A study of the culture of greenhouse crops including cucumbers, tomatoes, lettuce, rhubarb, and mushrooms; the growing of seeding plants both under glass and in the open for local retail or wholesale business.

2 class hours; 1 2-hour laboratory period.

Hours by arrangement.

Credit, 3.

Mr. JOHNSON.

78. (II) **COMMERCIAL OLERICULTURE.**—A study of the problems in the commercial production of vegetables: general culture, fertilizers and manures, machinery, labor, harvesting, and marketing. One or two trips to important markets and truck growing sections are required. Twenty-five dollars will cover the cost of these trips.

2 class hours; 1 2-hour laboratory period.

Hours by arrangement.

Credit, 3.

Mr. TUTTLE.

81. (I) 82. (II) **SEMINAR.**—Advanced study of problems relating to vegetable production.

1 class hour.

Hours by arrangement.

Credit, 1.

THE DEPARTMENT.

PHILOSOPHY.

Professor GLICK, Assistant Professor SHUTE.

61. (I) **INTRODUCTION TO PHILOSOPHY.**—A general approach to philosophy both from the standpoint of method and content; an attempt to understand and evaluate contemporary ideas.

3 class hours.

8:00-8:50 or 11:00-11:50 M. W. F.

Credit, 3.

Mr. GLICK.

62. (II) HISTORY OF PHILOSOPHY.—A survey of the development of western thought from the early Greeks to the present.

3 class hours.

8:00-8:50 or 11:00-11:50 M. W. F.

Credit, 3.

Mr. GLICK.

63. (I) LOGIC.—A study of the principles, problems and methods of critical thinking; emphasis upon principles and methods of formal logic; critical study of inductive reasoning and scientific method with applications to current problems.

3 class hours.

Credit, 3.

Mr. GLICK.

64. (II) ETHICS.—The meaning of good and evil, right and wrong; survey of ethical theories and practices both historical and contemporary; an attempt to evaluate these theories with reference to modern ethical problems.

3 class hours.

Credit, 3.

Mr. GLICK.

81. (I) PHILOSOPHY OF RELIGION.—A critical and constructive study of the origin and nature of religion; its various forms; its function in human life; its place as a cultural phenomenon.

3 class hours.

Credit, 3.

Mr. SHUTE.

Prerequisite, Philosophy 61 or 62.

82. (II) AESTHETICS.—The meaning of aesthetic experience; the objective and subjective character of beauty; the origin and nature of the art impulse; the place of art in culture and personality; the principles of criticism.

3 class hours.

Credit, 3.

Mr. SHUTE.

83. (I) READINGS IN ANCIENT PHILOSOPHY.—Special attention is given to the works of Plato and Aristotle.

3 class hours.

Credit, 3.

Mr. SHUTE.

84. (II) READINGS IN MODERN PHILOSOPHY.—Attention is focused on the writings of Kant, with a discussion of the background of his development and his influence on modern thought.

3 class hours.

Credit, 3.

Mr. SHUTE.

Prerequisite, Philosophy 61 or 62.

PHYSICAL EDUCATION FOR MEN

Professor GORE, Professor RADCLIFFE, Professor ECK, Professor LORDEN, Associate Professor KAUFFMAN, Assistant Professor DERBY, Assistant Professor BRIGGS, Assistant Professor ROGERS, Mr. BALL, Mr. SALWAK, Mr. KOSAKOWSKI, Mr. MASI.

3. (I) 4. (II) PHYSICAL EDUCATION—PHYSICAL FITNESS ACTIVITY COURSE.—Planned progressively to help every man student meet reasonable minimum standards of physical fitness and through regularity and continuity of physical exercise to maintain good physical condition. The men are given physical fitness ratings and must meet minimum standards in use of obstacle course, the basic skills in several team sports, as well as learn to swim.

3 hours.

Credit, 1.

Mr. GORE, Mr. ROGERS, Mr. SALWAK and the DEPARTMENT.

5. (I) PHYSICAL EDUCATION SURVEY.—A survey of the health, physical education, and physical recreation courses which make up the physical education major. This course provides an introduction to the broad field of physical education.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. GORE, Mr. ROGERS, Mr. SALWAK and the DEPARTMENT.

33. (I) 34. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

3 hours.

Credit, 1.

THE DEPARTMENT.

63. (I) 64. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

3 hours.

Credit, 1.

THE DEPARTMENT.

83. (I) 84. (II) PHYSICAL EDUCATION.—A physical fitness activity program.

3 hours.

Credit, 1.

THE DEPARTMENT.

22. (II) FIRST AID INSTRUCTORS.—The First Aid training course includes standard, advanced, and instructor courses, leading to qualification as American Red Cross First Aid Instructor with work in athletic training techniques and accident prevention.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. GORE.

41. (I) WINTER ACTIVITIES.—Winter ice and snow activities programs, including skiing, skating, conduct of winter

carnivals, winter sports safety; and the design, construction, and maintenance of winter sports facilities.

1 class hour; 1 2-hour laboratory period. Credit, 1.

9:00-9:50 Th.; laboratory hours by arrangement.

Mr. GORE, Mr. BRIGGS.

42. (II) AQUATICS.—The aquatic course gives training in water safety, swimming, diving, canoeing, boating, life-saving, and recreational swimming, leading to possible qualification as American Red Cross Water Safety instructor.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Hours by arrangement.

Mr. GORE, Mr. ROGERS, and the DEPARTMENT.

43. (I) OFFICIATING.—Technique and practice in officiating major sports.

1 class hour; 1 2-hour laboratory period. Credit, 1.

11:00-11:50 F.; laboratory hours by arrangement.

Mr. KAUFFMAN, Mr. BALL.

44. (II) TESTS AND MEASUREMENTS.—This course considers the status of measurement in physical education, an historical sketch, typical contributions in anthropometrics, strength tests, ability and achievement tests, cardiac functional tests, neuro-muscular control tests, and sport technique tests; and it includes the tools of measurement, indices, and the theory and practice of test administration.

2 class hours.

Credit, 2.

11:00-11:50 M. F.

Mr. SALWAK.

45. (I) HISTORY AND PURPOSES OF PHYSICAL EDUCATION.—A brief study of the history of the development of the various systems of physical education and a study of the aims and ideals of present-day physical education.

2 class hours.

Credit, 2.

11:00-11:50 M. W.

Mr. LORDEN.

51. (I) INTRODUCTORY COURSE FOR TEACHER-COACHES.—This course outlines the coaching of football, soccer, and basketball.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. ECK, Mr. LORDEN, Mr. BRIGGS, Mr. BALL.

52. (II) INTRODUCTORY COURSE FOR TEACHER-COACHES.—Continuation of Course 51. This course outlines the coaching of baseball, track and field athletics, hockey, and athletic pedagogy.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. LORDEN, Mr. DERBY, and the DEPARTMENT.

53. (I) PHYSICAL EDUCATION—ELEMENTARY SCHOOLS.—This course includes the objectives, organization, significance, and content of physical education in the grade schools. The course is correlated with the requirements of the State Department of Education.

2 class hours; 1 2-hour laboratory period.
11:00-11:50 Tu. Th.; 1:00-2:50 M.

Credit, 3.
Mr. DERBY.

54. (II) PHYSICAL EDUCATION—SPECIAL METHODS.—This course includes the objectives, significance, organization and content of physical education in junior and senior high school. The course is correlated with the requirements of the State Department of Education.

2 class hours; 1 2-hour laboratory period.
11:00-11:50 Tu. Th.; 1:00-2:50 M.

Credit, 3.
Mr. DERBY.

56. (II) ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION.—Considers the organization and administration of a department of physical education. Design, construction, maintenance, and service considerations of physical recreational areas are studied.

2 class hours.
9:00-9:50 Tu. Th.

Credit, 2.
Mr. HICKS.

57. (I) ORGANIZED CAMPING TECHNIQUES.—This course covers details of camping techniques from the three-fold angle of organized camp counselor, i.e., as a child counselor, as a general activities counselor, and as a specialty counselor.

3 class hours.
8:00-8:50 M. W. F.

Credit, 3.
Mr. GORE.

58. (II) ORGANIZED CAMPING ADMINISTRATION.—This course includes the history of organized camping, minimum standards of health and safety, the development of camping philosophies, trends, and the camping industry.

3 class hours.
8:00-8:50 M. W. F.

Credit, 3.
Mr. GORE.

59. (I) SCOUTING ELEMENTS AND PRINCIPLES.—A course in the elements and principles of scoutmastership, given in cooperation with the Scout Executive, Hampshire-Franklin Council, B.S.A.

1 class hour; 1 2-hour laboratory period.
Hours by arrangement.

Credit, 2.
Mr. GORE.

71. (I) 72. (II) SPECIAL PROBLEMS COURSES.—Presentation and discussion of research work in physical education, physical recreation, health and safety education, or athletics.

3 class hours.

Hours by arrangement. Mr. GORE and the DEPARTMENT.

73. (I) RECREATION — ADMINISTRATION AND ORGANIZATION.—Administration and organization of recreational areas,

including playground layouts, equipment supplies, maintenance, leadership, training activities, conduct of programs, and problems of operations.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. GORE.

74. (II) RECREATION—RECREATION LAND USE.—Including types of recreational areas, recreational resources, recreational needs of the people, geography of recreation, competitors of recreational land use, economic aspects of federal, state, and local recreational systems.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Hours by arrangement.

Mr. GORE.

76. (II) ANATOMY GENERAL.—A course in structural human anatomy.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Dr. RADCLIFFE.

78. (II) ANATOMY APPLIED—KINESIOLOGY.—A course aimed to give the anatomical application basal to a thorough understanding of the mechanical problems in apparatus, athletic, and corrective exercises.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Dr. RADCLIFFE.

Prerequisite, Physical Education 76.

PHYSICAL EDUCATION FOR WOMEN

Associate Professor TOTMAN, Miss HUBBARD, Miss WAGNER,
Mrs. HARMON.

7. (I) 8. (II) PHYSICAL EDUCATION.—Students are required to participate in one term of dancing, in one team sport, and to pass a safety test in swimming. Except for these requirements, all unrestricted students may select any activity which is offered. Fall season: field hockey, volleyball, soccer, archery, tennis, swimming. Winter season: basketball, volleyball, badminton, swimming, life saving (by permission), modern dance, square dance, calisthenics, posture training. Spring season: softball, soccer, archery, swimming, modern dance.

3 class hours.

Credit, 2.

THE DEPARTMENT.

27. (I) 28. (II) PHYSICAL EDUCATION.—The activities offered in Courses 7 and 8 are continued. In addition, advanced modern dance is offered in the fall season and water safety instruction in the winter season. Unrestricted students may select any activity which is offered.

3 class hours.

Credit, 2.

THE DEPARTMENT.

61. (I) 62. (II) PHYSICAL EDUCATION.—Participation in the activity classes for freshmen and sophomores, with the purpose of gaining further skill and developing physical fitness.

3 class hours.

Credit, 1.

THE DEPARTMENT.

81. (I) 82. (II) PHYSICAL EDUCATION.—Participation in activity courses for physical fitness with opportunity to learn refereeing in sports and to assist in teaching individual sports.

3 class hours.

Credit, 1.

THE DEPARTMENT.

PHYSICS

Professor POWERS, Associate Professor ALDERMAN, Associate Professor ROSS, Assistant Professor BURPO, Assistant Professor WANNLUND, Assistant Professor MATHIESON, Mr. CROOKER.

25. (I) MECHANICS, SOUND, AND HEAT.—This course is largely a study of the following and related topics; equilibrium of bodies; forms of energy and work; motion, fluids; surface tension; molecular phenomena; elasticity; wave-motion; sound; thermometry expansion; hygometry; transmission of heat; changes of state; radiation.

3 class hours; 1 2-hour laboratory period.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 8 or its equivalent.

26. (II) LIGHT AND ELECTRICITY.—Includes wave-theory of light; optical instruments; analysis of light; interference; polarization; magnetism; electrostatics; production and properties of electric currents; electrical appliances and machines; oscillatory circuits; vacuum tubes, and related topics.

3 class hours; 1 2-hour laboratory period.

Credit, 4.

THE DEPARTMENT.

Prerequisite, Physics 25.

51. (I) 52. (II) MAGNETISM, ELECTRICITY, PHOTO-ELECTRICITY, THERMIONICS AND APPLICATIONS.—Course 51 deals largely with direct currents; Course 52 with alternating currents, applications of thermionics, and photo-electricity. These courses are planned to give the student a good training in theory and methods of measurement in the indicated subjects, which are useful in many fields of investigation. Modern methods are stressed and instruments of precision are used.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu., Th.; 10:00-11:50 Tu. or 1:00-2:50 Tu. or W.

Mr. POWERS.

Prerequisites, Physics 26 and Mathematics 29 for Course 51; Physics 51 for Course 52.

55. (I) 56. (II) **MECHANICS**.—Development of the fundamental concepts of dynamics with applications to particles and rigid bodies in translation and rotation. One laboratory period may be substituted for one class hour.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.; laboratory by arrangement.

Mr. ROSS.

Prerequisites, Physics 26; Mathematics 30.

58. **PHOTOGRAPHY**.—Class work and laboratory practice in the fundamentals of photography. Types of cameras, characteristics of photographic emulsions, exposure and exposure meters, processing of negative and prints, enlarging, composition. Limited to ten students.

1 class hour; 2 3-hour laboratory periods.

Credit, 3.

3:00-3:50 W.; 1:00-3:50 M. F.

Mr. POWERS.

Prerequisites, Physics 25, 26; Chemistry 1, 2.

60. (II) **SOUND AND ACOUSTICS**.—A study of vibrations, vibrating bodies, coupled systems, sound structure, and acoustic properties. The work will include many applications of sound to technical and commercial fields.

3 class hours.

Credit, 3.

Mr. ALDERMAN.

Prerequisite, Physics 55 or its equivalent.

61. (I) 62. (II) **HEAT AND THERMODYNAMICS (1949-50)**. A study of heat exchanges and energy changes due to heat in systems of matter. The subject material and experimental methods are useful in other branches of science. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; 2:00-3:50 Th.

Mr. ALDERMAN.

Prerequisites, Physics 26; Mathematics 29.

63. (I) 64. (II) **OPTICS (1950-51)**.—An intermediate course in the theory of light. Work in geometrical and physical optics is done. Precision instruments are used in the laboratory. Given in alternate years.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; laboratory hours by arrangement.

Mr. ALDERMAN.

Prerequisites, Physics 26; Mathematics 29.

75. (I) 76. (II) **ADVANCED EXPERIMENTAL WORK IN SELECTED TOPICS**.—These courses are largely experimental and the subject matter is adapted to the needs of the individual student. The research viewpoint is emphasized. The class hour is used for a course in precision of measurements.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Mr. POWERS.

Prerequisites, Physics 51-52 or 55-56 or 63-64; Mathematics 29, 30.

85. (I) 86. (II) MODERN PHYSICS (1949-50).—Typical subjects studied are theories of the atom, radiation, quantum theory; spectra, X-ray analysis, nuclear reactions. Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. POWERS.

Prerequisites, Physics 51, 62 and 64 or equivalent; Mathematics 29, 30.

95. (I) 96. (II) ELECTRONICS (1948-49).—Given in alternate years.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. POWERS.

Prerequisites, Physics 51, 52; Mathematics 29, 30.

POMOLOGY

Professor FRENCH, Associate Professor ROBERTS, Assistant Professor O. G. ANDERSON, Mr. J. F. ANDERSON.

26. (II) SMALL FRUITS.—A study of the growing of raspberries, blackberries, strawberries, currants, blueberries, cranberries, and grapes, dealing with such questions as varieties, selecting a site for the plantation, soils, fertilizers, pruning, harvesting, and marketing.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 M. F.; 1:00-2:50 W.

Mr. O. ANDERSON.

53. (I) GENERAL POMOLOGY.—A study of the most improved practices in tree fruit production, including orchard sites and soils, laying out and setting the orchard, the structure and growth of fruit plants; the bearing habits, pruning, fertilizers, pollination; pest control; harvesting and marketing the crop.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 Tu. Th.; 3:00-4:50 F.

Mr. ROBERTS, Mr. J. ANDERSON.

56. (II) SPRAYING.—This course is especially designed to familiarize the student with details of pest control in the orchard. It involves a study of (a) spraying and dusting machinery; (b) methods in the application of materials used in orchards, with the important considerations for spraying each fruit and for combating each orchard pest; (c) preparation for use of the common fungicides and insecticides.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

8:00-8:50 Tu. Th.; 1:00-2:50 Tu.

Mr. ROBERTS.

57. (I) FRUIT JUDGING.—Practice in the identification, selection, and judging of fruit for exhibition purposes. From this class a team is selected to represent the University in Intercollegiate Fruit Judging Contests.

1 class hour.

Credit, 1.

Hours by arrangement.

Mr. O. ANDERSON.

75. (I) **SYSTEMATIC POMOLOGY (1950-51).**—A study of the more important kinds and varieties of fruits grown in the United States, their relationships and nomenclature. Particular emphasis is placed upon the identification, classification, and value of varieties including a study of the characters of the plant as well as the fruit. Given in alternate years.

1 class hour; 3 2-hour laboratory periods. Credit, 4.
9:00-9:50 Tu.; 1:00-2:50 M. W. F. Mr. O. ANDERSON.

77. (I) **COMMERCIAL POMOLOGY (1949-50).**—A critical consideration of the picking, grading, packing, storing, and marketing of fruits. This course also considers the leading American and foreign centers of fruit production as they affect our own fruit industry through competition here or abroad. A two-day market trip will be required at an approximate cost of ten dollars. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 W.

Mr. ROBERTS, Mr. J. ANDERSON.

81. (I) 82. (II) **ADVANCED POMOLOGY.**—A consideration of the scientific principles governing the growth and behavior of fruit-bearing plants. Special attention is given to the more important research work in the field of pomology.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Hours by arrangement. Mr. FRENCH.

Prerequisite, Pomology 53.

83. (I) 84. (II) **SEMINAR.**—Advanced study of problems relating to fruit production.

1 class hour. Credit, 1.
Hours by arrangement. THE DEPARTMENT.

85. (I) 86. (II) **CRANBERRY PROBLEMS.**—For seniors specializing in cranberry technology. Selected readings and individual work to familiarize students with the literature, research, and problems of the cranberry industry.

Credit, 2.
Hours by arrangement. Mr. FRENCH.

Plant Breeding

52. (II) **PLANT BREEDING METHODS.**—An advanced study of genetic topics peculiar to plants, also the methods and problems of the plant breeder. Laboratory work in genetic analysis and the breeding of plants.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. W.; 10:00-11:50 F. Mr. FRENCH.

Prerequisite, Zoology 53.

81. (I) 82. (II) **SPECIAL PROBLEMS IN PLANT BREEDING.**—Qualified seniors may carry on advanced study on special topics or undertake such original investigations as time and available material will permit.

Hours by arrangement. Credit, 2.
Mr. FRENCH.

Prerequisite, Plant Breeding 52.

POULTRY HUSBANDRY

Professor JEFFREY, Professor SANCTUARY, Assistant Professor BANTA, Assistant Professor VONDELL.

25. (I) GENERAL POULTRY.—Not open to students majoring in poultry husbandry. A general course giving an introduction to the breeds of poultry, the principles and practice of breeding, incubation, and poultry nutrition, brooding and rearing, houses and equipment, management practices, marketing poultry products, and the business of poultry keeping. 2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 10:00-11:50 or 1:00-2:50 or 3:00-4:50 Tu.
Mr. JEFFREY.

52. (II) INCUBATION AND BROODING.—This course is based upon the actual operation of incubators and brooders. Each year a research project is planned and data obtained concerning the effects of various incubator adjustments upon malpositions and maldevelopment of embryos and the percentage of hatch. Studies of temperature gradients, chick behavior and development are made in brooding with various types of equipment. Analysis is made of common and unusual field problems. 1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 Tu.; 3:00-4:50 Th.; other hours by arrangement.
Mr. SANCTUARY.

53. (I) POULTRY JUDGING.—Physiological and anatomical characters are used in production judging. The American Standard of Perfection is employed in a study of the more popular breeds and varieties, and for exhibition judging. Judging teams competing in the Eastern Intercollegiate Contest are trained in this course. 1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-8:50 Tu.; 1:00-2:50 W. F.
Mr. BANTA.

55. (I) POULTRY HOUSING AND SANITATION.—In this course are considered the biological factors related to the proper physical environment necessary for growth, health, and reproduction. Various systems of ventilation and methods of insulation are studied and demonstrated by models. Humidity, temperature, and condensation studies are made at the poultry plant with varying adjustments of ventilation devices. A study is made of modern equipment. Sanitation from the standpoint of disease prevention practices is also considered. 1 class hour; 1 2-hour laboratory period. Credit, 2.
11:00-11:50 Tu.; 3:00-4:50 Th.
Mr. SANCTUARY.

56. (II) POULTRY NUTRITION.—A study of the scientific principles of nutrition, classification and identification of

feedstuffs, formulation and calculation of rations for specific purposes. A class trip may be arranged.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th.; 1:00-2:50 W.

Mr. BANTA.

75. (I) **MARKETING POULTRY PRODUCTS.**—A study of the preparation and grading methods of eggs and poultry products to meet the requirements of the northeastern markets. The laboratories are designed to cover the fields of modern dressing, processing and packaging of poultry; as well as grading, candling and quality studies of eggs. A one-half day class trip to Springfield markets in December is required. Estimated cost, two dollars.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

10:00-10:50 Tu.; 3:00-4:50 W.

Mr. VONDELL.

76. (II) **TURKEY PRODUCTION.**—This course includes the production of ducks and geese but most of the time is given to the turkey industry; its importance, breeds, breeding, incubation, brooding, feeding, finishing, marketing, etc.

1 class hour; 1 2-hour laboratory period.

Credit, 2.

1:00-1:50 M.; 1:00-2:50 W.

Mr. VONDELL.

77. (I) **POULTRY BREEDING.**—The improvement of poultry by selection is developed through a study of the principles of heredity. The inheritance of morphological and physiological characters including plumage color, egg production, meat production, hatchability, egg traits, and disease resistance.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

11:00-11:50 M. W.; 3:00-4:50 F.

Mr. JEFFREY.

Prerequisite, Zoology 1, 53.

78. (II) **SEMINAR AND FARM MANAGEMENT.**—A combination seminar and lecture course designed to give the student a comprehensive view of all phases of the poultry industry. A field trip covering approximately three days will be arranged. Students may elect an additional problem credit.

3 class hours; 1 2-hour laboratory period may be elected.

Credit, 3, 4.

10:00-10:50 M. W. F.

Mr. JEFFREY.

PSYCHOLOGY

Professor NEET, Assistant Professor FELDMAN, Assistant Professor GOSS, Assistant Professor VALLANCE, Miss PHILLIPS, Mr. RONAN, Mr. WALLACE, Dr. MICHELSON.

26. (I) and (II) **GENERAL PSYCHOLOGY.**—This is an introductory course dealing with the basic principles and applications of psychology with regard to the understanding and control of behavior. Topics considered include the nature

and development of behavior, motivation, learning, problems of adjustment, intelligence, aptitudes, and personality.

3 class hours.

Credit, 3.

THE DEPARTMENT.

28. (II) **ADVANCED GENERAL PSYCHOLOGY.**—A consideration of some of the major problems of psychology. Topics considered include motivation, emotion, neutral relationships, learning, thinking, perception, sensory processes, and individual differences.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

51. (I) **EXPERIMENTAL PSYCHOLOGY.**—This course is designed to give an understanding of the problems, methods, and data of experimental psychology. One of the basic functions of the course is to acquaint the student with the scientific method as applied to experimental studies of behavior.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

10:00-10:50 Tu. Th.; 1:00-2:50 Tu. W. or Th. Mr. NEET.

Prerequisite, Psychology 26.

56. (II) **EDUCATIONAL PSYCHOLOGY.**—A study of psychological facts and principles fundamental to education, teaching, and personal relationships between teacher and pupil. Topics considered in relation to school situations are: physical and mental growth, intelligence, motivation, emotions, learning, transfer of training, and mental hygiene of teacher and pupil.

3 class hours.

Credit, 3.

9:00-9:50 Tu. Th. S.

Mr. VALLANCE.

Prerequisite, Psychology 26.

61. (I) **SOCIAL PSYCHOLOGY.**—A study of human behavior as influenced by interaction with others. Major topics considered are: the socialization of motives, the nature and sources of personality, social attitudes and their measurement, mechanisms of social interaction, behavior in crowd and audience, language and communicative behavior, custom and conforming behavior, prejudice, and general theories of social behavior.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. VALLANCE.

Prerequisite, Psychology 26.

63. (I) **PHYSIOLOGICAL PSYCHOLOGY.**—A study of the relationships between the individual's behavior and his physiological processes. Emphasis will be placed on sensory and motor phenomena, drives, emotional behavior, and learning.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. FELDMAN.

Prerequisites, Psychology 26; Zoology 35.

72. (II) **ADVANCED EXPERIMENTAL PSYCHOLOGY.**—The literature, techniques, and apparatus of experimental psychology are considered in detail, and selected projects are carried out individually by the members of the class.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 Th.; 1:00-2:50 Tu. Th.

Mr. NEET.

Prerequisite, Psychology 51.

75. (I) **STATISTICS IN PSYCHOLOGY.**—The application of statistical procedures to the analysis of psychological data and to problems of measurement in psychology and related fields.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

2:00-2:50 M. F.; 3:00-4:50 W.

Mr. Goss.

Prerequisites, Psychology 26; Agricultural Economics 79 or Mathematics 62.

81. (I) 82. (II) **PSYCHOLOGICAL TESTS.**—Different varieties of psychological tests are studied. The first semester considers group tests of intelligence, aptitude, interest, personality, and clinical tests. The second semester is devoted to a consideration of individual and performance tests of intelligence and to the nature and theories of intelligence. Practice will be given in administering, scoring, interpreting, and evaluating tests. Either semester may be elected independently.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

1:00-1:50 F.; 1:00-2:50 M. W. or 3:00-4:50 Tu. Th.

Miss PHILLIPS.

Prerequisite, Psychology 26.

83. (I) **ABNORMAL PSYCHOLOGY.**—A study of the principles relative to the causes, prevention, symptoms, and treatment of behavior abnormalities. Special attention is given to the following: sensory and motor disorders, speech problems, emotional extremes, memory losses and other disorders of association, the neuroses and psychoses, and mental deficiency. Hospital trips and clinics.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

86. (II) **INDUSTRIAL PSYCHOLOGY.**—The course aims to give understanding of psychological principles and methods in business and industrial situations. Topics considered include: employee selection and training, motivation and morale, design of machines and equipment, working conditions, fatigue, accident prevention, and advertising and selling.

3 class hours.

Credit, 3.

9:00-9:50 M. W. F.

Mr. ROMAN.

Prerequisite, Psychology 26.

88. (II) **PSYCHOLOGY OF GUIDANCE.**—A study of the psychological principles, techniques and tests necessary in guidance. Practice is given in organizing and evaluating relevant data in the analysis of illustrative cases.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th.; 3:00-4:50 M. or W.

Mr. WALLACE.

Prerequisite, Psychology 26 and 81 or consent of the instructor.

90. (II) **CONTEMPORARY PSYCHOLOGIES.**—A logical, historical, and systematic analysis of contemporary psychological theories, including structuralism, functionalism, Gestalt and organismic psychologies, psychoanalysis, and behaviorisms from Thorndike and Watson to the contemporary scene.

3 class hours.

Credit, 3.

2:00-2:50 M. W. F.

Mr. Goss.

Prerequisite, Psychology 26.

92. (II) **CLINICAL PSYCHOLOGY.**—A study of the techniques and methods involved in the diagnosis and treatment of behavior disorders. Diagnostic clinical testing, counselling, and other psychotherapeutic procedures are given consideration. Hospital trips and clinics.

3 class hours.

Credit, 3.

11:00-11:50 M. W. F.

Mr. FELDMAN, Dr. MICHELSON.

Prerequisite, Psychology 83 or consent of the instructor.

94. (II) **CHILD PSYCHOLOGY.**—This course aims to develop an understanding of the behavior of the child from birth to adolescence. Psychological aspects of the following topics are considered: original nature, maturation, mental development, emotions, play, social behavior, language, speech defects, learning, moral behavior, personality and mental hygiene. Nursery school observation and practice.

3 class hours.

Credit, 3.

10:00-10:50 M. W. F.

Mr. NEET.

Prerequisite, Psychology 26.

95. (I) 96. (II) **PROBLEMS IN PSYCHOLOGY.**—For qualified seniors. The student will be allowed to do independent work and study on special problems or in certain fields of psychological interest. By arrangement with the members of the department.

Credit, 1.

THE DEPARTMENT.

ROMANCE LANGUAGES

Professor FRAKER, Professor GODING, Assistant Professor
CLARKE, Assistant Professor FERRIGNO, Miss ROGERS,
Mr. CESTRE, Mr. WEXLER.

French

1. (I) 2. (II) **ELEMENTARY FRENCH.**—For those who have had no previous French or whose preparation is insufficient for more advanced courses. Intensive drill for rapid reading, writing, speaking and understanding. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

4 class hours.

Credit, 3.

THE DEPARTMENT.

3. (I) 4. (II) **INTERMEDIATE FRENCH.**—Primarily a reading course with stress on both exact translation and rapid reading for comprehension. Grammar review and oral practice. Recommended for those who want only a reading knowledge of French.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, French 1 and 2, or 2 years of high school French.

5. (I) 6. (II) **ADVANCED INTERMEDIATE FRENCH.**—Readings from representative masterpieces of French literature. Composition, grammar review, intensive oral practice.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, French 3 and 4, or 2 years of high school French, or permission of the Department.

9. (I) 10. (II) **ORAL PRACTICE.**—Not open to freshmen except in conjunction with another course in French. Intensive oral practice, vocabulary study, grammar essentials for fluent speech. Recommended for those who desire a reasonably good command of the spoken language.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, French 3 and 4 or equivalent or permission of the instructor.

15. (I) 16. (II) **SURVEY OF FRENCH LITERATURE.**—Readings from representative masterpieces of French literature. Review of grammar. Composition, outside reading. Conducted in French except for one section conducted in English.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisites, French 5 and 6 or 3 years of high school French.

Advanced Courses

Prerequisites, French 15 and 16, or French 5 and 6 and permission of the instructor. Since most of the advanced courses are conducted in French, the student should have a reasonable oral command of the language before electing these courses. For this purpose the student is advised to take French 9 and 10, or spend one year in the French House.

29. (I) 30. (II) FRENCH LITERATURE OF THE SEVENTEENTH CENTURY (1949-50).—A survey of the Classic period, with readings from representative works. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

31. (I) 32. (II) FRENCH LITERATURE OF THE NINETEENTH CENTURY (1950-51).—A detailed study of the more important authors and movements. Given in alternate years.

3 class hours.

Credit, 3.
Mr. GODING.

51. (I) FRENCH LITERATURE OF THE EIGHTEENTH CENTURY (1950-51).—Rousseau: The Encyclopedists. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

52. (II) VOLTAIRE (1950-51).—A study of the Eighteenth Century through the life and works of Voltaire. Given in alternate years.

3 class hours.

Credit, 3.
Mr. FRAKER.

53. (I) 54. (II) FRENCH LITERATURE OF THE TWENTIETH CENTURY.

3 class hours.

Credit, 3.
Miss CLARKE.

75. (I) COURS DE STYLE.—A study of syntax and idioms at an advanced level. The student is taught how to express himself clearly and logically in living French.

4 class hours.

Credit, 3.
Mr. CESTRE.

79. (I) FRENCH CIVILIZATION.—A study of those elements which lie back of the cultural contribution of France to the world civilization. Subjects studied will include arts, sciences, school systems, the press, the family, social classes, influences of history and geography. The assigned readings will be drawn from contemporary French Literature.

4 class hours.

Credit, 3.
Mr. GODING.

80. (II) **TEACHER TRAINING COURSE.**—Practice teaching, methods, outside readings, observations, reports.
4 class hours.

Credit, 3.
Mr. GODING.

82. (II) **ADVANCED GRAMMAR AND COMPOSITION.**—Phonetics. Recommended for majors who intend to teach French.
4 class hours.

Credit, 3.
Mr. GODING.

Italian

51. (I) 52. (II) **ELEMENTARY ITALIAN.**—An introductory course for those who have had no previous Italian or whose preparation is insufficient for more advanced work. Training in grammar, composition, pronunciation, with special emphasis on reading.
4 class hours.

Credit, 3.
Mr. FERRIGNO.

75. (I) 76. (II) **INTERMEDIATE ITALIAN.**—Primarily a reading course with considerable attention to review of grammar, and speech.
4 class hours.

Credit, 3.
Mr. FERRIGNO.

Spanish

1. (I) 2. (II) **ELEMENTARY SPANISH.**—Grammar, exercises in composition and conversation, reading of selected short stories. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

3 class hours; 4th hour optional. Credit, 3.
Mr. FRAKER, Mr. FERRIGNO, Miss ROGERS.

7. (I) 8. (II) **INTERMEDIATE SPANISH.**—Readings from modern authors; grammar review.
3 class hours; 4th hour optional.

Credit, 3.
Mr. FERRIGNO, Miss ROGERS.
Prerequisites, Spanish 1 and 2 or three years of high school Spanish.

29. (I) **THE ROMANTIC PERIOD (1948-49).**—Readings from representative authors; written and oral composition. Given in alternate years.
2 class hours; 1 2-hour laboratory period.

Credit, 3.
Mr. FRAKER.

Prerequisites, Spanish 7 and 8.

30. (II) **THE MODERNISTS (1948-49).**—Dario, Nervo and their contemporaries; composition and conversation. Given in alternate years.
2 class hours; 1 2-hour laboratory period.

Credit, 3.
Mr. FRAKER.

Prerequisite, Spanish 29.

73. (I) 74. (II) **THE GOLDEN AGE (1949-50).**—Readings from Cervantes, Lope de Vega, Calderon, Garcilaso and others. Composition and conversation. Given in alternate years. 2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. FRAKER.

Prerequisites, Spanish 7 and 8.

Russian

Mr. GABRYS.

51. (I) 52. (II) **ELEMENTARY RUSSIAN.**—Grammar, exercises in composition and conversation, selected readings. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Dean.

4 class hours.

Credit, 3.

THE DEPARTMENT.

Prerequisite, previous language training.

SOCIOLOGY

Professor KORSON, Mr. DRIVER, Mr. MANFREDI, Mr. DOTSON.

28. (I) and (II) **INTRODUCTION TO SOCIOLOGY.**—An outline of the social order, and of the individual considered as a member of his various groups.

3 class hours.

Credit, 3.

THE DEPARTMENT.

51. (I) **URBAN SOCIOLOGY.**—A comparative study of modern social conditions, and methods of adjustment, with special reference to city environment. Characteristics of the population, urban ecology, and problems of adjustment in the fields of housing, health, education, and recreation.

3 class hours.

Credit, 3.

2:00-2:50 Tu. Th., third hour by arrangement.

Mr. MANFREDI.

Prerequisite, Sociology 28.

52. (II) **RURAL SOCIOLOGY.**—A study of rural society from the standpoint of its population, institutions, standards of living, and their relation to urban society.

3 class hours.

Credit, 3.

Mr. KORSON.

Prerequisite, Sociology 28.

53. (I) **AN INTRODUCTORY STUDY OF CULTURAL ANTHROPOLOGY.**—A non-technical sociological study of man in pre-literate societies.

3 class hours.

Credit, 3.

Mr. MANFREDI.

Prerequisite, Sociology 28.

54. (II) **AMERICAN RACE RELATIONS.**—The social, economic, and political aspects of racial problems in the United

States, with particular reference to the Negro and major ethnic groups. A rabbi, minister, and priest are invited to address the class, and visits are made to the respective churches.

3 class hours.

Credit, 3.
Mr. KORSON.

Prerequisite, Sociology 28.

57. (I) THE FAMILY.—The history and development of the customs of courtship and marriage from primitive society to the American family. The basic causes of changes and trends of the family are considered. The folkways and mores of marriage in other contemporary societies are also studied.

3 class hours.

Credit, 3.
Mr. KORSON.

Prerequisite, Sociology 28.

61. (I) POPULATION PROBLEMS.—An analytical study of population trends and problems of the world; the origin, composition, growth, migration, and urbanization of the American population. A consideration of population pressure as a cause of migratory movements.

3 class hours.

Credit, 3.
Mr. DRIVER.

Prerequisite, Sociology 28.

75. (I) SOCIAL PROBLEMS.—A study of abuses affecting the home, recreation, business, industry, family, welfare, public health government, mental disease, and crime. The charitable and correctional institutions of Massachusetts as agencies of reform. Visits to Belchertown State Schools, Northampton State Hospital, and Northampton Superior Court are arranged, and specialists in their fields will be invited as speakers.

3 class hours.

Credit, 3.
Mr. DRIVER.

10:00-10:50 M. W. F.

Prerequisite, Sociology 28.

76. (II) INTRODUCTION TO SOCIAL WELFARE.—For senior majors and others who qualify. Contemporary problems of social concern: causes of poverty; methods of caring for adult and child dependents and defectives. A consideration of public and private agency administration and techniques, and an examination of federal, state, and local community programs.

3 class hours.

Credit, 3.
Mr. DRIVER.

Prerequisites, Sociology 28, 51, 75.

78. (II) CRIMINOLOGY.—A study of the nature of crimes and the factors underlying criminal behavior. Attention is also given to the machinery of justice in criminal behavior:

the law, the courts, police enforcement, penal and correctional institutions.

3 class hours.

Credit, 3.
Mr. DRIVER.

Prerequisite, Sociology 75.

79. (I) 80. (II) SEMINAR.—Admission by permission of instructor. A study of the methods of research employed by sociologists. Students, under direction of the instructor, analyze and organize such sociological material as they gather through their own research. Projects must be approved in advance by the instructor.

Hours by arrangement.

Credit, 3.
Mr. KORSON.

82. (II) SOCIOLOGICAL THEORY.—An examination of the contributions of European and American writers who have concerned themselves with theories of the origin, growth, and development of human social organization.

3 class hours.

Credit, 3.
Mr. MANFREDI.

Prerequisite, Sociology 53.

SPEECH

Associate Professor NIEDECK, Assistant Professor ROBERTSON, Mr. ZAITZ, Mr. STELKOVIS, and the INSTRUCTORS IN ENGLISH.

3. (I) 4. (II) PUBLIC SPEAKING.—This course is designed to give the student introductory instruction and opportunity in oral self-expression and includes both public speaking and literary interpretation. Scheduled under English 1, 2.

1 class hour.

Credit, 1.
THE DEPARTMENT.

89. (I) DRAMATIC PRODUCTION.—This course offers instruction and practice in casting, directing, make-up, lighting, and scenic design and construction.

3 2-hour laboratory periods.

Credit, 3.
Mr. NIEDECK, Mr. ROBERTSON.

91. (I) (II) EXTEMPORE SPEECH.—The theory and practice of public speaking for business and professional purposes.

3 class hours.

Credit, 3.
Mr. NIEDECK, Mr. ZAITZ, Mr. STELKOVIS.

92. (II) FORMAL DISCUSSION.—Most of the semester is devoted to formal discussion: its organization and presentation. Students are given the opportunity to lead and to participate in discussions of current problems.

3 class hours.

Credit, 3.
Mr. ZAITZ.

Prerequisite, Speech 91.

VETERINARY SCIENCE

Professor LENTZ, Associate Professor SMITH.

51. (I) VETERINARY HYGIENE.—The essentials of the health of animals and specific diseases of animals are considered.

3 class hours.

8:00-8:50 M. W. F.

Credit, 3.

Mr. LENTZ.

75. (I) COMPARATIVE VETERINARY ANATOMY.—The structure of the horse is studied and the structures of other farm animals are compared with it.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mr. SMITH.

76. (II) GENERAL VETERINARY PATHOLOGY.—A study of fundamental, general pathological conditions; inflammation, fever, etc., and application of principles of etiology, pathogenesis, and prophylaxis of communicable and non-communicable diseases of domesticated animals.

3 class hours.

11:00-11:50 M. W. F.

Credit, 3.

Mr. SMITH.

88. (II) AVIAN PATHOLOGY.—Consists of lectures devoted to principles of pathology, with specific application to avian diseases. Etiology, pathogenesis, and prophylaxis will be emphasized.

3 class hours.

Hours by arrangement.

Credit, 3.

Mr. LENTZ.

ZOOLOGY

Professor WOODSIDE, Professor BISHOP, Assistant Professor TRAVER, Assistant Professor BARTLETT, Assistant Professor ROLLASON, Assistant Professor SNEDECOR, Mr. ANDREWS, Miss TILTON, Mr. BOND, Mr. D. H. BISHOP, Mr. BAIRD, Mr. KATSH.

1. (I) and (II) INTRODUCTORY ZOOLOGY.—(Constitutes one semester of the freshman course in biology). This course provides an introduction to the principles of biology, with special reference to the zoological aspects. The structure and activities of a representative vertebrate animal, the frog, are considered in detail and the knowledge thus gained is utilized in a comprehensive survey of the major groups of the animal kingdom. Brief introductions are given to the principles of classification, nutrition, structure and functions of protoplasm, genetics, heredity, development, and evolution.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

9:00-9:50 Tu. Th. or 11:00-11:50 M. W.; laboratory hours as sectioned.

Mr. WOODSIDE, Mr. ANDREWS, Miss TILTON,
Mr. D. H. BISHOP, Mr. KATSH.

25. (I) SURVEY OF THE ANIMAL KINGDOM.—Lectures emphasize those aspects of the zoological sciences which are least stressed in the introductory course: the principles of classification; ecology; economic importance; and the history of zoology in relation to man's progress. The laboratory work will include several exercises in field work; studies on representatives of phyla not covered previously; the morphological adaptations of animals to special modes of existence; and some simple zoological techniques.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 M. F.; 1:00-2:50 Tu. or W. or Th.

Mr. BARTLETT, Mr. ANDREWS, Mr. BOND.

Prerequisite, Zoology 1.

35. (I) and (II) VERTEBRATE PHYSIOLOGY.—An introductory course which will include consideration of circulation, respiration, digestion, metabolism, excretion, chemical and nervous coordination, muscular activity, and reproduction. The laboratory work will acquaint the student with some of the equipment and methods used in physiological studies, with emphasis on the experimental approach to the laboratory exercises.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. SNEDECOR, Mr. KATSH.

50. (II) HISTOLOGY OF THE VERTEBRATES.—A study of the types of tissues found in the body of vertebrate animals, and of the organs in which these tissues occur. Tissues and organs of mammals are emphasized. A knowledge of comparative anatomy is advised.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

9:00-9:50 Tu.; 1:00-2:50 Tu. Th. Mr. ROLLASON.

Prerequisite, Zoology 1.

51. (I) and (II) MICROTECHNIQUE OF ANIMAL TISSUES.—The course comprises (1) a consideration of the principles and methods of microtechnique as applied to animal tissues, and (2) a series of practical exercises in the preparation of animal tissues for microscopic examination. Registration is limited to 12 students per semester. Consult instructor for section assignments.

2 2-hour laboratory periods. Credit, 2.

10:00-11:50 Tu.; 1:00-2:50 W. Miss TILTON.

Prerequisite, Zoology 1.

53. (I) PRINCIPLES OF GENETICS.—Lectures and laboratory experiments concerning the laws governing the transmission of hereditary factors in plants and animals, expression and action of genes, population genetics, and the relationship of genetics to other biological sciences. A laboratory period may be substituted for one class hour.

3 class hours. Credit, 3.

11:00-11:50 M. W. F.

Mr. ROLLASON, Mr. D. W. BISHOP, Mr. D. H. BISHOP.

69. (I) ANIMAL PARASITOLOGY.—Important protozoan and helminthic parasites of man and domestic animals. Emphasis is placed upon morphology, physiological activities, classification and phylogeny of the parasite; life cycles, vectors, and modes of transmission; host-parasite relationships, and other fundamental principles of parasitism as a way of life. 1 class hour; 2 2-hour laboratory periods. Credit, 3.

Miss TRAVER.

Prerequisite, Zoology 1.

70. (II) ADVANCED INVERTEBRATE ZOOLOGY.—A survey of the invertebrate animals from evolutionary and phylogenetic aspects. Morphology, modes of nutrition and reproduction, interrelationships with other animals, and distribution in time and space, are considered, as well as classification. Marine, freshwater and land faunas representative of each major group are studied.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

Miss TRAVER.

Prerequisite, Zoology 25 or equivalent.

71. (I) COMPARATIVE VERTEBRATE ANATOMY.—A thorough study of the anatomy of the vertebrates, with emphasis on the evolution, special modifications, and functional interrelationships of each of the organ systems. A systematic approach in both lecture and laboratory work. Animals studied in the laboratory are: protochordates, lamprey, dogfish, lizard, bird, and cat.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

1:00-1:50 Tu. Th.; 1:00-3:50 M. F. or 2:00-4:50 or 8:00-10:50 Tu. Th., or 1:00-3:50 W., 9:00-11:50 S.

Mr. BARTLETT, Mr. BOND, Mr. BAIRD.

Prerequisite, Zoology 1.

72. (II) VERTEBRATE EMBRYOLOGY.—Lectures and laboratory work dealing with the development of representative animals, special emphasis being placed on the amphibian, bird and mammal.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

1:00-1:50 M. F.; 2:00-4:50 M. F. or 2:00-4:50 Tu. Th.

Mr. WOODSIDE, Mr. D. H. BISHOP, Mr. ROLLASON.

Prerequisite, Zoology 71.

73. (I) GENERAL CYTOLOGY.—A consideration of the morphological features of cells in relation to their function. Lectures, seminar reports and laboratory work will deal with cytoplasmic structure and inclusions and nuclear phenomena. 2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. ROLLASON.

Prerequisites, Zoology 51, 51.

77. (I) EXPERIMENTAL EMBRYOLOGY.—Lectures, seminar reports and laboratory work dealing with the chief factors in the mechanics and physiology of development: the germ

cells; fertilization, establishment of the primary axis; embryonic induction, and differentiation.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. WOODSIDE.

Prerequisite, Zoology 72.

80. (II) ORNITHOLOGY.—An introduction to the study of ornithology which aims to serve as a basis for further technical study or for the development of a life-time hobby. Lectures are of a general nature covering as many branches of ornithological knowledges as possible. Laboratory work includes field identification and the anatomy of the pigeon. Enrollment limited to fifteen.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

8:00-8:50 Th.; 3:00-4:50 M. F.

Mr. BARTLETT.

Prerequisites, Zoology 1 and permission of instructor.

81. (I) VERTEBRATE ZOOLOGY.—An introduction to the vertebrates, their classification and ecology, with particular emphasis on the fishes. Field trips for the study of local fauna will be included as a part of the laboratory exercises. Course limited to eighteen students.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

9:00-9:50 W.; 1:00-2:50 Tu. Th.

Mr. ANDREWS, Mr. BARTLETT.

Prerequisite, Zoology 1.

83. (I) COMPARATIVE PHYSIOLOGY.—A course designed to familiarize students with physiological principles and adaptations to the environment of animals throughout the invertebrate and vertebrate phyla. In the laboratory the experimental method will be developed involving general procedures and individual problems.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

Mr. D. W. BISHOP, Mr. BOND.

Prerequisites, Zoology 1, 35.

84. (II) GENERAL CELLULAR PHYSIOLOGY.—The properties and processes common to all organisms, including protoplasmic organization, permeability, metabolism, movement, bioelectricity, and reproduction.

2 class hours; 2 3-hour laboratory periods.

Credit, 4.

Mr. D. W. BISHOP, Mr. KATSH.

Prerequisites, one year biology; organic chemistry.

85. (I) CLASSES OF ARTHROPODS OTHER THAN INSECTS.—Arthropods are studied from the phylogenetic standpoint, with special reference to their relationship to the origin and evolution of insects.

1 class hour; 2 2-hour laboratory periods.

Credit, 3.

10:00-10:50 Tu.; 1:00-2:50 Tu. Th.

Mr. HANSON.

86. (II) FISHERY BIOLOGY.—Theory in the practice of regulating freshwater fisheries; the physical and biological conditions of the environment and their influence on fish populations.

2 class hours; 1 2-hour laboratory period.

Credit, 3.

Mr. ANDREWS.

Prerequisite, Zoology 81 and permission of instructor.

87. (I) ENDOCRINOLOGY. — Emphasis will be directed toward the importance of the endocrines in their control over normal functions (growth, metabolism, reproduction, etc.) in a variety of animals.

2 class hours; 1 3-hour laboratory period.

Credit, 3.

Mr. SNEDECOR.

Prerequisite, Zoology 1.

91. (I) 92. (II) SPECIAL PROBLEMS IN ZOOLOGY.—Qualified graduate students and seniors who have met departmental requirements for specialization in the field of zoology may arrange for work on a special problem in zoology.

Credit, 3.

THE DEPARTMENT.

Invertebrate Zoology, Marine Biological Laboratory,
Woods Hole, Massachusetts.

Credit, 3.

DEGREES CONFERRED 1949

RECIPIENTS OF HONORARY DEGREES

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BERNICE HELEN STANISZEWSKI	Palmer
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MILDRED LOUISE WEST	Fall River
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BACHELOR OF ARTS

Summa Cum Laude

DAVID PATRICK BUCKLEY	Boston
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Magna Cum Laude

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LORRAINE SILVERMANN GOLDIN*	Chelsea
PHILLIP GEORGE MARSH	Roxbury
JAMES EDWIN SPAULDING	Northfield

Cum Laude

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CLARENCE ADOLPH BURLEY	North Brookfield
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EDWARD MARTIN CYNARSKI	Adams
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RUTH BEEBE EMRICK	Haydenville
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JOHN ROBERTS BLALOCK Alexandria, Va.
MAURICE BLAUER Belmont
WARREN JULIUS BODENDORF Montgomery
JOSEPH EDWARD BRINSON Thomasville, Ga.
MARGARET CAROL CASSIDY Uxbridge
JOHN JOSEPH COHAN Worcester
SUZANNE COLSON-FIFER Doullens, France
CLARK EDWARD CORLISS St. Albans, Vt.
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CHARLES CLIFFORD ENTWISTLE New Salem

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CHARLES JAMES WILEY	Philadelphia
MARGARET KOERBER WILHELM	Northampton
GEORGE STAPLES YEE	Allston

DOCTOR OF PHILOSOPHY

AZMI A. AFIFI	Giza, Egypt
EDWARD EVERETT ANDERSON	Amherst
GARLAND BOOKER BASS	Reidsville, N. C.
R. KEMAL GOKCE	Erzincan, Turkey
DALE ALBERT HINKLE	Fayetteville, Arkansas
CHAUDHRY MOHAMMED ISHAQ	Quetta, Pakistan
OMER KOSKER	Neusehir, Turkey
ANDRE PATRON	Neuilly, France
RAJUPALLI RAMAMURTI REDDI	Cuddapah, South India
DONALD BERNARD SEELEY	Strafford, Conn.
CLARA EDITH WEIR	Wingham, Ontario

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GIFTS AND BEQUESTS

For the information of those who may wish to make a gift or a bequest to this University, the following suggestion is made as to a suitable form which may be used.

There are a number of worth-while activities of the University which are handicapped by lack of funds and for which small endowments would make possible a greater measure of service to our students and to the Commonwealth. The religious work on the Campus is an example. This is now carried on in a very limited way by current private contributions. Further information concerning this and other activities in similar need will be gladly furnished by the President.

SUGGESTED FORM

"I give and bequeath to the Trustees of the University of Massachusetts, at Amherst, Massachusetts, the sum ofdollars."

(1) (Unrestricted)

"To be used for the benefit of the University of Massachusetts in such manner as the Trustees thereof may direct."

or (2) (Permanent Fund: income unrestricted)

"to constitute an endowment fund to be known as the..... Fund, such fund to be kept invested by the Trustees of the University of Massachusetts and the annual income used for the benefit of the College in such manner as the Trustees thereof may direct."

or (3) (Specific Purposes)

"to be used for the following purposes,"

(Here specify in detail the purposes.)

UNIVERSITY OF MASSACHUSETTS ENROLLMENT

October 1949

UNDERGRADUATE COLLEGE

SCHOOL	1950		1951		1952		1953		Total		
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
Liberal Arts	237	40	135	55	86	61	91	99	549	255	804
Science	185	33	133	26	107	36	113	59	538	154	692
Engineering	266	0	149	0	112	0	53	0	530	0	530
Horticulture	110	1	51	6	43	1	36	3	245	11	256
Business											
Administration ...	136	1	88	4	80	4	53	5	357	14	371
Agriculture	67	3	50	1	50	2	29	2	196	8	204
Home Economics ..	0	30	0	36	0	49	0	62	0	177	177
Division of Physical											
Education	22	0	17	0	7	0	16	0	62	0	62
Specials									5	16	21
TOTALS	1023	108	623	128	490	153	991	230	2532	635	3167

GRADUATE SCHOOL

Men	Women	Total
260	45	305

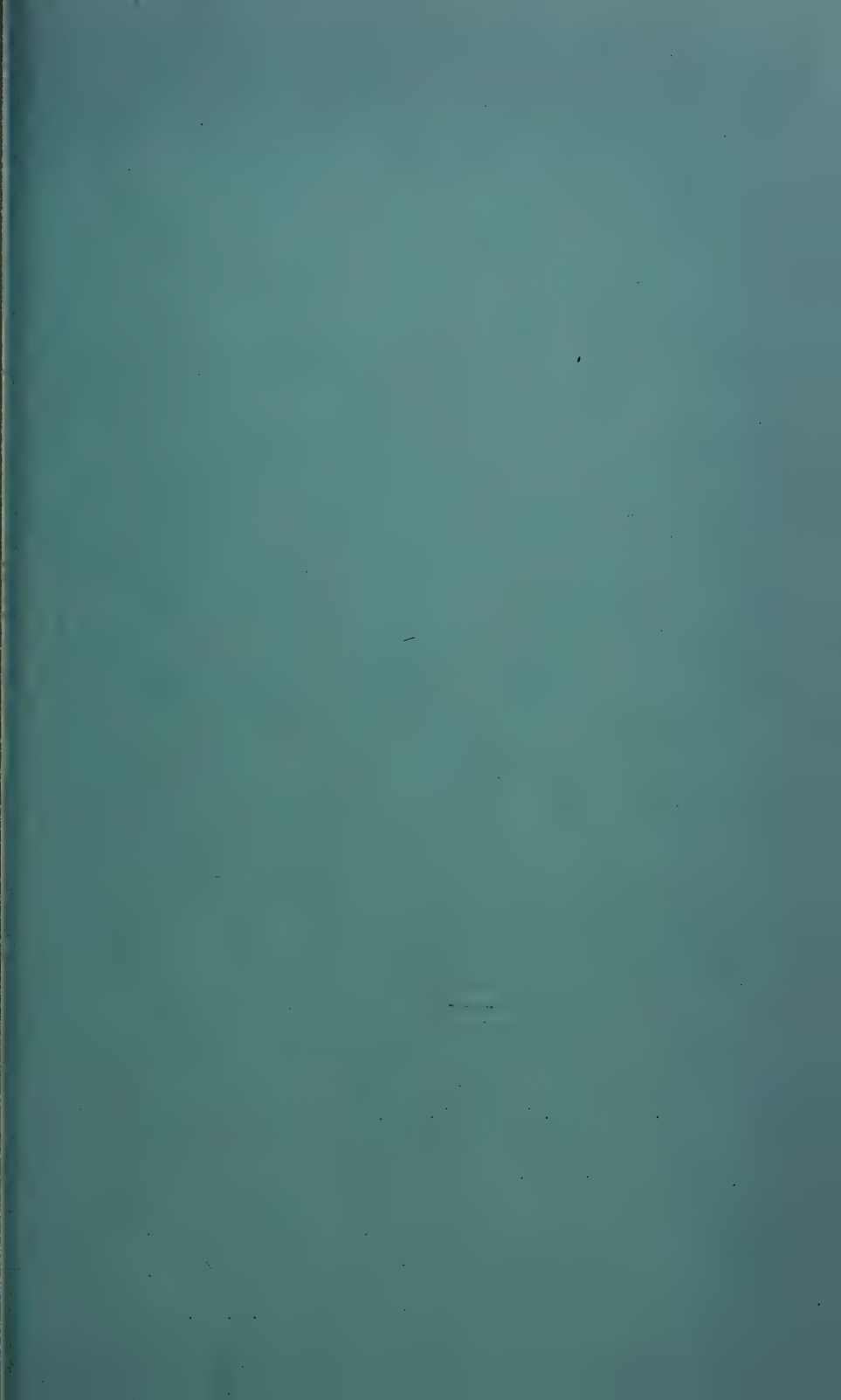
STOCKBRIDGE SCHOOL

1950		1951		Total
Men	Women	Men	Women	
191	3	248	6	448

SUMMARY (October 1949)

Undergraduate College	3167
Graduate School	305
Stockbridge School	448
TOTAL ENROLLMENT	3920

Office of Publications, October 1949



*Other University of Massachusetts
Catalogues:*

- Summer School Catalogue
- Graduate School Catalogue
- Stockbridge School Catalogue

THE UNIVERSITY OF MASSACHUSETTS

BULLETIN



1950 Summer Session Catalogue
Amherst, Massachusetts

SIX-WEEK SUMMER
SCHOOL • JUNE 26-AUG. 5

Volume XLII APRIL, 1950 Number 4

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UNIVERSITY OF MASSACHUSETTS SUMMER SESSION

1950

June 26 - August 5

The University of Massachusetts will offer a six-week Summer Session in 1950. Many of the basic courses of the regular year are offered, along with special courses to meet the needs of graduate and undergraduate college students, veterans, teachers, school officials and persons interested in pursuing college work for self-improvement regardless of college credit. All courses will be taught by the regular University faculty assisted by specialists in various fields.

LOCATION

The University of Massachusetts is located in Amherst, near the geographical center of the State. This town of 7,000 inhabitants overlooks one of the most picturesque sections of the Connecticut River Valley. The valley is noted for its scenic beauty and its educational institutions. The University has a winter enrollment of 3800, and its 700-acre campus contains 50 major buildings and a library of 175,000 volumes.

DEGREE CREDIT

All courses offered carry degree credit. They are organized on a one-semester basis, and are equivalent in method, content, and credit to courses offered in the University during the regular academic year. Credits obtained in these courses are ordinarily accepted as transfer credits by other colleges and universities. Students attending the Summer Session may earn not more than six semester hours of credit toward graduate or undergraduate degrees, except in cases where the Dean grants special permission to do more work.

COURSES OF STUDY

No students who are entering the undergraduate college for the first time are accepted. Acceptance of students registered in other colleges for study in the Summer Session does not guarantee admission to the University later as a transfer student.

Many courses are planned especially to meet the academic and professional needs of prospective teachers and of those in active service.

A number of the courses may be applied toward advanced degrees in colleges of liberal arts, and in professional schools. The facilities of the University are available for students enrolled for graduate study or research in special fields.

EXPENSES

- | | |
|--|----------|
| 1. Tuition for Residents of Massachusetts | |
| Entire session (full program) | \$25.00 |
| Entire session (one course only) | \$15.00 |
| 2. Tuition for Non-Residents and Veterans under Public Laws 16 and 346 (Undergraduates only). | |
| Entire session (full program) | \$100.00 |
| Entire session (one course only) | 60.00 |
| Tuition for Non-Residents (Graduate Students) | |
| Entire Session (full program) | \$60.00 |
| Entire Session (one course only) | \$35.00 |
| 3. Students' Activities Fee, All Students | 2.00 |
| 4. Room rent for 6 weeks at \$3.50 per week | \$21.00 |
| 5. Board for 6 weeks (Monday through Friday) at \$9.50 per week | \$57.00 |
| 6. Payment for Summer Session fees is due June 19 and must be paid at or before registration. No student will be eligible to attend classes until fees are paid. | |

ROOMS AND BOARD

Students, not commuting from home, are required to live in University Dormitories and board at the Dining Halls.

Board tickets are sold at the rate of \$9.50 for five days, Monday through Friday. Saturday and Sunday board at University Dining Halls is optional.

COURSE OFFERINGS

The University reserves the right to withdraw any course in which less than eight students are enrolled.

ADVANCE ENROLLMENT; VETERANS AND CIVILIANS

In order to facilitate arrangements, students contemplating attendance should notify the Dean at once, using the application form on page 9.

Veterans who plan to enroll under the G.I. Bill must present at the time of registration evidence of eligibility (V. A. certificate of eligibility or, if previously enrolled, a clearance through the University Coordinator). Veterans failing to obtain certification must make payment of tuition and fees.

New students who are not under G.I. Bills must file certificate of residence with the Treasurer's Office.

CALENDAR

June 26—9:00 a.m.—12.00 M. Registration, Drill Hall.
1:00 p.m.—3:00 p.m. Registration, Drill Hall.

June 27—8:00 a.m. Classes begin.

July 4, Tuesday. No college exercises. Classes normally scheduled for this day will be held Saturday, July 8.

August 4, 5—Final examinations.

August 5—12:00 M. End of Summer Session.

LIST OF COURSES

The following courses will be offered in accordance with the schedule indicated. In general, courses numbered 50 or above are acceptable for graduate credit.

	Credit
BOTANY 1. INTRODUCTORY BOTANY. The morphology and physiology of plants. 1-1:50 MTWTF, Clark Hall, B; 10-11:50 MTWTF, Clark Hall, D.	3
CHEMISTRY 29. QUALITATIVE ANALYSIS. A study of the fundamental principles and laws concerning the behavior of solutions of electrolytes. 1-4:50 MTWTF, Goessmann 26 and 7. Prerequisite, Chemistry 2, General.	4
CHEMISTRY 30. QUANTITATIVE ANALYSIS. The theory and practice of representative determinations, both gravimetric and volumetric. 8-11:50 MTWTF, Goessmann 28 and 228. Prerequisite, Chemistry 29, Qualitative Analysis.	4
DAIRY INDUSTRY 78. ICE CREAM MAKING. A study of the principles and practices of ice cream making with some time devoted to refrigeration, machinery, delivery equipment, and merchandising methods. 8-11:50 MTWTF, Flint Laboratory.	4
ECONOMICS 25. ELEMENTS OF ECONOMICS. Definitions and introductory principles of production, exchange, and the financial organization of society; the economics of distribution and the use of wealth and income. 10-11:50 MTWTF, Goessmann Auditorium.	3
ACCOUNTING 25. PRINCIPLES OF BUSINESS ACCOUNTING. The principles underlying the accounting system in the gathering, analysis, and interpretation of accounting data. 1-3:50 MTWTF, North College, 406.	3
ECONOMICS 79. LABOR PROBLEMS. An analysis of the background and character of the modern labor problem with special reference to the United States. 8-9:50 MTWTF, Liberal Arts Annex, 11A.	3
ECONOMICS 73. MODERN ECONOMIC THEORY. A study of current theories about value, distribution and prices. 10-11:50 MTWTF, North College, 407.	3
FINANCE 53. MONEY, BANKING, AND CREDIT. A critical survey of the development and operation of the monetary and banking systems of the United States. 1-2:50 MTWTF, Old Chapel, D.	3
MARKETING 53. MARKETING AND MARKETING PROBLEMS. A study of the forces and conditions which determine prices and the mechanism, methods, and problems concerned with transporting, storing and distributing economic goods. 8-9:50 MTWTF, Stockbridge Hall, 113.	3
INDUSTRIAL ADMINISTRATION 84. PERSONNEL ADMINISTRATION. A study of the principles of the management of labor relations. 10-11:50 MTWTF, Liberal Arts Annex, 11A.	3
GOVERNMENT 25. AMERICAN GOVERNMENT. A study of the structure and operation of our federal government with special consideration given to changes of the twentieth century and to present-day problems. 10-11:50 MTWTF, Stockbridge Hall, 113.	3
GOVERNMENT 52. EUROPEAN GOVERNMENTS. Forms and methods of the governments of Europe: historic types and theories of government, progress and problems of democracy; dictatorships and totalitarian governments. 1-2:50 MTWTF, Old Chapel, C.	3

- EDUCATION 52. PRINCIPLES AND METHODS OF TEACHING. Generally accepted teaching principles and procedures with applications in the major fields represented by the class.
8-9:50 MTWTF, Liberal Arts Annex, 32. 3
- EDUCATION 53. TESTS AND MEASUREMENTS. Construction, administration, scoring and interpretation of results of educational tests.
10-11:50 MTWTF, Liberal Arts Annex, 32. 3
- EDUCATION 66. AUDIO-VISUAL AIDS IN EDUCATION. A wide variety of aids studied from the point of view of how they may be used effectively in teaching.
8-9:50 MTWTF, Liberal Arts Annex, 30. 3
- EDUCATION 83. PRINCIPLES OF SECONDARY EDUCATION. Considers aims, pupil population, program, guidance, extra-curriculum, etc., of junior and senior high school.
8-9:50 MTWTF, Liberal Arts Annex, 1. 3
- EDUCATION 109. SECONDARY SCHOOL ADMINISTRATION. Considers problems in housing, finance, schedule, the library, cafeteria, public relations, etc., from the point of view of the administrator.
10-11:50 MTWTF, Liberal Arts Annex, 1. 3
- EDUCATION 167. AUDIO-VISUAL LABORATORY. A second course dealing with operation, care and minor repair of a wide variety of equipment including projectors, recorders, radios, etc.
10-11:50 MTWTF, Liberal Arts Annex, 30. 3
- EDUCATION 170. ELEMENTARY SCHOOL CURRICULUM. Content and methodology with emphasis on the unit method and activity program.
8-9:50 MTWTF, Liberal Arts Annex, 3. 3
- EDUCATION 171. ELEMENTARY READING AND LANGUAGE ARTS. Purposes, methods and materials of oral and written language and reading.
10-11:50 MTWTF, Liberal Arts Annex, 3. 3
- CIVIL ENGINEERING 27. PLANE SURVEYING. The basic principles of mensuration. Instruction and problems involving the use of the tape, transit, and level; preparation of a map of a small area.
3 44-hour weeks: August 7-26. 3
Prerequisite, Mathematics 5 or 7, Algebra and Trigonometry.
- CIVIL ENGINEERING 28. PROPERTY AND TOPOGRAPHIC SURVEYING. A transit and tape property survey and a plane table topographic survey of selected areas.
3 44-hour weeks: June 5-24; June 26-July 15. 3
Prerequisite, Civil Engineering 25 or 27, Surveying.
- CIVIL ENGINEERING 30. ROUTE SURVEYING PRACTICE. A preliminary survey for a short highway location and the preparation of maps and profile from the data recorded on the survey.
3 44-hour weeks: June 5-24; June 26-July 15. 3
Prerequisite, Civil Engineering 26, Route surveying.
- MECHANICAL ENGINEERING 23. SHOP. Approximately half the course is spent in woodworking, pattern making, and welding; the other half deals with the various machine and hand tools used in metal working.
3 44-hour weeks; August 28-September 16. 3
- MECHANICAL ENGINEERING 27. SHOP. Woodworking and pattern making on machines and with hand tools at the bench; various methods of welding.
3 44-hour weeks June 5-24; June 26-July 15; July 17-August 5; August 7-26. 3

- MECHANICAL ENGINEERING 28. MACHINE SHOP.** A knowledge of metal-working equipment is obtained by using the fundamental machine tools such as the lathe, planer, shaper, milling machine and drill press. 3
3 44-hour weeks: June 5-24; June 26-July 15; July 17-August 5; August 7-26.
- ENGLISH 2. COMPOSITION.** Intended to teach straight thinking, sound structure, clear and correct expression. Includes one credit of Public Speaking 4, Oral self-expression. 3
8-9:50 MTWTF, Old Chapel, B.
- ENGLISH 25 AND/OR 26. A SURVEY OF ENGLISH LITERATURE.** A general reading course, from the beginning of English literature to the end of the nineteenth century 2 or 4
8-9:50 MTWTF, Old Chapel, A.
- ENGLISH 56. AMERICAN PROSE.** A course in the chief American prose writers of the nineteenth and twentieth centuries, among them being Emerson, Thoreau, Hawthorne, Melville, Mark Twain, Henry Adams, and Henry James. 3
10-11:50 MTWTF, Old Chapel, B.
- ENGLISH 68. MODERN DRAMA.** The development of English and American drama from the time of Ibsen to the present day. The purpose of the course is to impart an intelligent and enthusiastic interest in the theatre of the twentieth century. 3
10-11:50 MTWTF, Old Chapel, A.
- FOOD TECHNOLOGY 51. INTRODUCTORY COURSE.** A general elementary course covering food economics, production, distribution and processing. 3
1-5 MWF, Chenoweth Laboratory.
- FOOD TECHNOLOGY 61. INDUSTRIAL TECHNOLOGY.** A survey of commercial practices in the manufacture and preservation of food products. 3
1-5 MWF, Chenoweth Laboratory.
Prerequisites, Food Technology 51 and 52, Introductory; Bacteriology 31, Introductory.
- FORESTRY 52. FOREST PHOTOGRAMMETRY.** The use of aerial photographs in present-day forest management practice. Map making and forest inventory. Field trips for checking photographic detail on the ground and inspection of photogrammetric equipment. Cost of texts and equipment about \$22. 3
1-3:50 MTWTF, French Hall, 106.
- FORESTRY 55. ELEMENTS OF FOREST MENSURATION.** Methods of determining the volume and value of the forest growing stock; type mapping as it pertains to timber cruising; methods of predicting growth of trees and stands. 3
8-10:50 MTWTF, French Hall, 106.
- FRENCH 3. INTERMEDIATE FRENCH.** Primarily a reading course with stress on both exact translation and rapid reading for comprehension. 3
8-9:50 MTWTF, Liberal Arts Annex, 8.
Prerequisite, Elementary French.
- FRENCH 80. TEACHER TRAINING COURSE.** Practice teaching, methods, outside readings, observations, reports. 3
10-11:50 MTWTF, Liberal Arts Annex, 8.
- SPANISH 1. ELEMENTARY SPANISH.** Grammar, exercises in composition and conversation, reading of selected short stories. 3
1-2:50 MTWTF, Liberal Arts Annex, 8.
- HISTORY 5. MODERN EUROPEAN CIVILIZATION.** The course covers the period from the later Middle Ages to 1815. 3
10-11:50 MTWTF, Old Chapel, D.
- HISTORY 59. HISTORY OF THE UNITED STATES.** A survey of the national development of American democracy to 1865. 3
8-9:50 MTWTF, Old Chapel, D.

- HISTORY 65. NINETEENTH AND TWENTIETH CENTURY ENGLAND.** Movements and problems of the age are studied largely through biographies of leaders such as, Bright, Palmerston, Shaftesbury, Gladstone, Disraeli, J. Chamberlain, Beatrice Webb, and Churchill. Some study of contemporary problems. 3
8-9:50 MTWTF, Old Chapel, C.
- HISTORY 70. EUROPE SINCE 1918.** Approximately half of the course is devoted to international affairs, the other half to a study of internal developments in the principal European countries. 3
10-11:50 MTWTF, Old Chapel, C.
- JOURNALISM 85. INTRODUCTION TO JOURNALISM.** A basic course in reporting designed to acquaint the student with the scope, principles, and practice of contemporary journalism. 3
10-11:50 MTWTF, Old Chapel, Seminar.
- JOURNALISM 86. NEWS WRITING AND EDITING.** Some attention is given to the feature story and to the school newspaper. 3
8-9:50 MTWTF, Old Chapel, Seminar.
- MATHEMATICS 7. ALGEBRA AND TRIGONOMETRY.** Fractions, quadratic equations, exponents, logarithms, variation, determinants of the second and third orders, and plane trigonometry. 3
10-11:50 MTWTF, Mathematics Building, B.
- MATHEMATICS 91. ADVANCED CALCULUS.** Series, expansion of functions, partial differentiation, envelopes, and multiple integrals. 3
8-9:50 MTWTF, Mathematics Building, B.
Prerequisite, Mathematics 30, Integral Calculus.
- MUSIC 51. DISCOVERING MUSIC.** An elementary, non-technical course dealing with the elements of music, forms in music, musical compositions, and with selected composers. 3
1-2:50 MTWTF, Memorial Hall.
- PHILOSOPHY 64. ETHICS.** A study of the fundamental ethical theories and practices both historical and contemporary. 3
8-9:50 MTWTF, Stockbridge Hall, 114.
- PHILOSOPHY 62. HISTORY OF PHILOSOPHY.** A survey of the development of western thought from the early Greeks to the present. 3
1-2:50 MTWTF, Stockbridge Hall, 114.
- PHILOSOPHY 165. PHILOSOPHY OF EDUCATION.** A criticism and evaluation of the various theories and practices in education viewed in the light of historical perspective and present-day science and theory. 3
10-11:50 MTWTF, Stockbridge Hall, 114.
- PHYSICAL EDUCATION 53. PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS.** This course is correlated with the requirements of the State Department of Education and includes the objectives, significance, organization, and content of physical education in the grade schools. 3
8-9:50 MTWTF, Physical Education Building, 10.
- PHYSICAL EDUCATION 54. SPECIAL METHODS.** This course is correlated with the requirements of the State Department of Education and includes the objectives, significance, organization, and content of physical education in junior and senior high school. 3
10-11:50 MTWTF, Physical Education Building, 10.
- PHYSICAL EDUCATION 57. ORGANIZED CAMPING TECHNIQUES.** This course covers the details of camping techniques from the three-fold angle of organized camp counselor, i.e., as a child counselor, as a general activity counselor, and as a specialty counselor. It also includes the opportunity to visit many types of camps while they are in session and to talk with camp directors. Several

laboratory periods will be devoted to camp cooking and night sleep-outs.
1-2:50 MTWTF, Physical Education Building, 10.

PSYCHOLOGY 26. GENERAL PSYCHOLOGY. An introductory course dealing with the basic principles and applications of psychology with regard to the understanding and control of behavior.

8-9:50 MTWTF, Liberal Arts Annex, 20.

PSYCHOLOGY 86. INDUSTRIAL PSYCHOLOGY. Topics considered include: employee selection and training, motivation and morale, design of machines and equipment, working conditions, fatigue, accident prevention, and advertising and selling.

10-11:50 MTWTF, Liberal Arts Annex, 27.

Prerequisite, Psychology 26, General.

PSYCHOLOGY 88. PSYCHOLOGY OF GUIDANCE. A study of the psychological principles, techniques and tests necessary in guidance, with practice in organizing and evaluating relevant data in the analysis of illustrative cases.

8-9:50 MTWTF, Liberal Arts Annex, 27.

Prerequisites, Psychology 26, General, and 81, Tests, or consent of instructor.

PSYCHOLOGY 92. CLINICAL PSYCHOLOGY. A study of the techniques and methods involved in the diagnosis and treatment of behavior disorders. Diagnostic clinical testing, counselling and other psychotherapeutic procedures.

10-11:50 MTWTF, Liberal Arts Annex, 22.

Prerequisite, Psychology 83, Abnormal, or consent of instructor.

PUBLIC HEALTH 61. GENERAL AND COMMUNITY SANITATION. A study of problems of rural and municipal sanitation. Cause and control of communicable diseases, official and voluntary health agencies, water supplies, sewerage and sewage, cross connections, swimming pools and shell fish.

8-9:50 MTWTF, Marshall Annex, 4.

PUBLIC HEALTH 62. GENERAL AND COMMUNITY SANITATION. A study of problems of rural and municipal sanitation. Insects and rodent control; sanitation of eating utensils; refuse and garbage disposal; food and milk sanitation; nuisances; housing, camp, and school sanitation.

10-11:50 MTWTF, Marshall Annex, 4.

PUBLIC HEALTH 91. FIELD TRAINING IN ENVIRONMENTAL SANITATION. Instruction in the various phases of environmental sanitation as a prerequisite for placement in federal, state, or municipal agencies. Enrolment limited to 16 public health majors approved by the department.

8 44-hour weeks. July 10-September 2. Marshall Hall.

SOCIOLOGY 28. INTRODUCTION TO SOCIOLOGY. An outline of the social order, and of the individual considered as a member of his various groups.

8-9:50 MTWTF, Goessmann, 26.

SOCIOLOGY 53. AN INTRODUCTORY STUDY OF CULTURAL ANTHROPOLOGY. A non-technical sociological study of man in preliterate societies.

10-11:50 MTWTF, Goessmann, 26.

Prerequisite, Sociology 28, Introductory.

SOCIOLOGY 54. AMERICAN RACE RELATIONS. The social, economic, and political aspects of racial problems in the United States, with particular reference to the Negro and major ethnic groups.

8-9:50 MTWTF, Stockbridge Hall, 102.

Prerequisite, Sociology 28, Introductory.

SOCIOLOGY 57. THE FAMILY. The history and development of the customs of courtship and marriage from primitive society to the American family.

10-11:50 MTWTF, Stockbridge Hall, 102.

Prerequisite, Sociology 28, Introductory.

APPLICATION FOR ADMISSION

Prospective students may use the form below in applying for admission to the 1950 Summer Session. This should be sent to The Dean, University of Massachusetts, Amherst, Mass.

 UNIVERSITY OF MASSACHUSETTS

1950 Summer Session

NAME

ADDRESS

COURSES:

*Name and No.**Descriptive Title*

I am a graduate of.....

and received my degree inon.....19

I am a college student at

in the class of 19....

Will you be studying under the G.I. Bill?

I will need a room in the dormitory (please check)

I will commute(please check)



*Other University of Massachusetts
Catalogues:*

- Undergraduate Catalogue
- Graduate School Catalogue
- Stockbridge School Catalogue

Bulletin

UNIVERSITY OF
MASSACHUSETTS

COMMENCEMENT

1950





PRESIDENT'S LETTER

TO ALUMNI AND FRIENDS OF THE UNIVERSITY OF MASSACHUSETTS:

Welcome to our Eightieth Commencement.

We hope your visit with us will be very much worthwhile in terms of friendships renewed and a fresh contact with the University. Many changes have come to the campus recently but the friendships formed here have not changed and the campus itself is the same friendly place you have known so well.

These exercises mark the graduation of the largest number of veterans enrolled in one class under the educational program for former members of the armed services. Eighty percent of this class are veterans. Their purposeful industry and their maturity of judgment have set new standards in the classroom and in extra-curricular activities.

This graduating class of eleven hundred is the largest we have ever had. It is a pleasure to welcome you to the Commencement exercises.

Sincerely,

RALPH A. VAN METER

PROGRAM



FRIDAY, JUNE 2, 1950

8:00 P.M. Informal Class Reunions.

9:00 P.M. Sophomore-Senior Hop

SATURDAY, JUNE 3, ALUMNI-CLASS DAY

10:00 A.M. Annual Meeting, Associate Alumni Memorial Hall.

10:30 A.M. Semi-Annual Meeting, Board of Trustees, President's Office.

11:30 A.M. Alumni Clambake, Drill Hall.

2:00 P.M. Alumni Parade to Ball Game.

2:30 P.M. Varsity Baseball Game with Springfield College, Alumni Field.
Following Game — Half Hour Concert on Chime.

5:30 P.M. Senior Class Night Exercises, Goodell Library Lawn (In case of rain, the Cage).

6:00 P.M. Fraternity and Class Reunions as arranged by organizations.

9:00 P.M. Roister Doister Play, "Angel Street."

SUNDAY, JUNE 4, COMMENCEMENT

9:00 A.M. Academics and Varsity Club Breakfast Meetings, Draper Hall.

11:00 A.M. Baccalaureate Service, The Cage.
Speaker: The Reverend James Keller, M.M.
The Christophers, New York City

12:00 P.M. Fraternity and Class Reunions as arranged by organizations.

2:30 P.M. Academic Procession from Memorial Hall.

3:00 P.M. Graduation Exercises.

Address by his Excellency Paul Andrew Dever, LL.B.,
LL.D., Governor of the Commonwealth

ALUMNI REUNION PROGRAM

SATURDAY, JUNE 3

- 10:00 A.M. Annual Meeting of the Associate Alumni, Auditorium, Memorial Hall.
- 11:30 A.M. Annual Alumni Clambake, Drill Hall.
Alternative luncheon, Draper Hall.
- 2:00 P.M. Alumni Parade, Memorial Hall to Alumni Field.
- 2:30 P.M. Varsity Baseball Game—with Springfield College, Alumni Field. Following the game there will be a half-hour concert on the college chime.
- 6:00 P.M. Class and fraternity reunions and suppers as arranged by the various organizations.
- 9:00 P.M. Roister Doister Play—"Angel Street," Bowker Auditorium.

CLASS REUNIONS

ALUMNI REGISTRATION HEADQUARTERS, MEMORIAL HALL

- 1890 60th Reunion—Henri D. Haskins, 15 East Pleasant St., Amherst.
- 1894 Annual Reunion—Dr. S. Francis Howard, 58 Main St., Northfield, Vt.
- 1895 55th Reunion—Albert F. Burgess, 24 Franklin St., Greenfield.
- 1900 50th Reunion—Edwin K. Atkins, 15 Hubbard Ave., Northampton.
- 1905 45th Reunion—A. D. Taylor, 7016 Euclid Ave., Cleveland, Ohio.
- 1910 40th Reunion—Lawrence S. Dickinson, Stockbridge Hall.
John N. Everson, Stockbridge Hall.
- 1911 Annual Reunion—F. A. McLaughlin, West Experiment Station.
- 1915 35th Reunion—William L. Doran, Clark Hall.
- 1925 25th Reunion—Lewis H. Keith, 11 Garden St., Melrose Highlands.
Donald E. Ross, French Hall.
- 1930 20th Reunion—Raymond S. Mann, 8 Farview Ave., Danbury, Conn.
- 1935 15th Reunion—Raymond K. Evans, Davenport Ridge Rd., Stamford, Conn.
- 1940 10th Reunion—Myron D. Hager, Leete's Island, Guilford, Conn.
Winslow E. Ryan, 1164 North Pleasant St., No. Amherst.
- 1945 5th Reunion—Joseph C. Kunces, 12 Washburn St., Middleboro.
Patricia Andersen, 53 California Ave., Springfield.
- 1947 3rd Reunion—Gordon P. Smith, 67-09A 223rd Place, Bayside, L. I., N. Y.
- 1949 1st Reunion—Wallace J. Kallaugher, L-5, Federal Cir., Amherst.

Bulletin

UNIVERSITY OF
MASSACHUSETTS

STOCKBRIDGE SCHOOL
OF AGRICULTURE
1950-1951



"No other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought, as agriculture. I know nothing so pleasant to the mind as the discovery of anything that is at once new and valuable—nothing that so lightens and sweetens toil as the hopeful pursuit of such discovery. And how vast and how varied a field is agriculture for such discovery. The mind, already trained to thought in the country school or higher school, cannot fail to find there an exhaustless source of enjoyment. Every blade of grass is a study; and to produce two where there was but one is both a profit and a pleasure. And not grass alone; but soils, seeds, and seasons; hedges, ditches and fences; draining, drouths, and irrigation; plowing, hoeing and harrowing; reaping, mowing and threshing; saving crops, pests of crops, diseases of crops, and what will prevent or cure them; implements, utensils, and machines, their relative merits, and to improve them; hogs, horses, and cattle; sheep, goats, and poultry; trees, shrubs, fruits, plants, and flowers; the thousand things of which these are specimens—each a world of study within itself."

— ABRAHAM LINCOLN —

*From address at Wisconsin State Fair,
Milwaukee, Wisconsin, September 30, 1859.*

Note: President Abraham Lincoln signed the bill known as the Morrill Act, sponsored by Senator Justin Morrill of Vermont, in 1862 in the midst of the great Civil War. This law established agricultural colleges in every state of the country under federal aid.

Massachusetts accepted the provisions of this Act in 1863, indicating that "the leading object of the College shall be to teach subjects relating to agriculture and the mechanic arts so as to promote liberal and practical education."

Thus was born our modern system of agricultural education which is contributing so greatly to the health and welfare of this nation and of the world.

Bulletin

UNIVERSITY OF MASSACHUSETTS

Stockbridge School of Agriculture
1950-1951



The University of Massachusetts is both a State University and a Land Grant College and as such has been established by Acts of Congress and of the Legislature of Massachusetts.

The two year course in practical agriculture at The University of Massachusetts is known as The Stockbridge School of Agriculture, named after an early president of the University. Included herein are descriptions of the various courses offered, information concerning expenses, enrolment, regulations, etc. In the back of catalogue will be found forms for application and certificate of citizenship.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

UNIVERSITY BULLETIN

Amherst, Massachusetts

VOLUME XLII

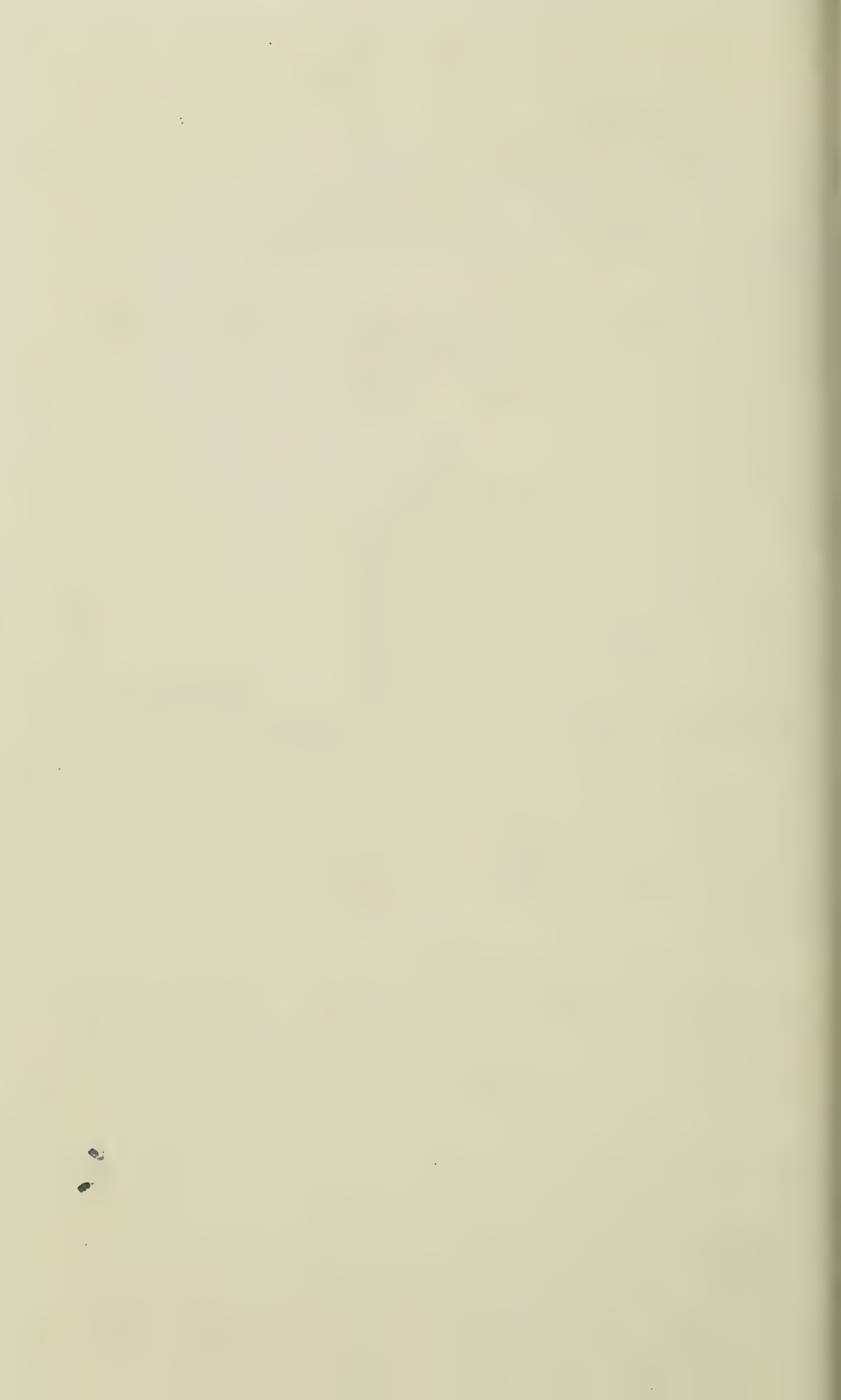
JUNE, 1950

NUMBER ⁶~~15~~

Published five times a year by the University of Massachusetts, January, March, April, May, June.

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FOREWORD

Since 1918 the University of Massachusetts has been providing for its citizens two-year vocational program of courses covering the principal fields of technical and applied agriculture and horticulture. This past year the total enrolment in the Stockbridge School of Agriculture was 449 including 189 veterans.

The Place of Agriculture in Education.—By John Chandler, Commissioner of Agriculture for Massachusetts. Excerpts.

"I am sure you join with me in marveling at the tremendous strides which have been made in agriculture during the last twenty-five years. When I started farming, thirty-five years ago, we were farming just about the way our fathers and grandfathers had farmed for hundreds of years. We were following methods and practices handed down from father to son, ways which had proved practical through trial and error. To be sure there had been a few advances, the steel plow, the mowing machine, the binder and the ensilage cutter and crude manure spreaders had come into use. Now only a short generation later we look back at those early days and marvel at the advances which have taken place in plant and livestock breeding, in mechanization made possible by the internal combustion engine and electric power, in chemistry as expressed in new fertilizer and spray materials, in the science of bacteriology, in cultures and tillage practices, and in the physical methods of caring for soils, known as soil conservation practices.

I can remember hoisting hay by the forkful on to endless loads and mowing away by hand in the smothering heat of dusty haylofts; doing all the milking by hand by the light of a lantern; driving the cows out to watering troughs in the yard, winter and summer; cutting ensilage corn with a corn knife and gathering it in armfuls and placing it on wagons to draw to the silo. I can remember cutting ice in the winter and bucking it into the ice house, digging it every day all summer to float in a tank to keep the milk sweet; the endless mending of fences; shovelling out manure in the winter on a little sled body and leading by hand on the snow; driving every day through snow or mud over rutted roads in an express wagon three miles to a railroad station carrying eight-part cans of milk which went to some milk dealer in a distant city, who paid me what he thought he could get away with—usually $2\frac{1}{2}$ to 3 cents per quart; walking behind a plow, and then,—Oh glorious day, riding a sulky plow—jumping over the stones, and walking all day in the dust behind one kind of a row or another. Clearing out stone walls with horses, a drag, crowbars—a very slow and expensive undertaking.

All these things are just back around the corner. It is almost incredible how we have advanced. No longer are we farmers bowed down by never-ending idleness, and too tired to raise our eyes to the new horizons ahead. Today the farmers of Massachusetts are using their minds and their ingenuity in growing better and larger crops, with less and less labor. I believe we are right at the start of the greatest renaissance our agriculture has ever experienced. Younger men are stepping in to operate our farms, using their brains and imaginations as well as their strong bodies. They are expanding and improving their farms as never before. They are building into their enterprises greater stability with security for themselves and their families. Of all the classifications of industries in our State today—farming is the most up-and-coming—is advancing the fastest, and offers the greatest opportunity for young men endowed with adventurous and pioneer spirit.

The land is the same good land we have always had, but we are learning to improve and expand our acres with the help of modern heavy equipment so that our little old farms, cut up into small fields surrounded by stone walls and hedges, are beginning to blossom with large fields suitable for the use of modern equipment, so that in the next few years, I believe, our countryside, will be dotted

with as efficient farms as there are anywhere in the world. Add to this the fact that we operate in the midst of a dense population, with the finest markets anywhere at our very doors. Is it any wonder that the young men are beginning to see the prospects ahead and that a pioneer spirit is abroad in our countryside?***

A hundred, or a thousand years ago for that matter, agriculture was a trade and was not considered a fitting subject for intellectual development. Almost everybody was a farmer back home anyway and was well aware of the relation between food and life. The facts of life were all about them. But since that day the industrial era has changed our civilization as we know it. Now a fortunate few raise all the food for the many. Most everybody is so far removed from the soil, particularly in industrial regions like ours, that they have lost track of one of the great fundamentals of existence. An educated man should understand the Mendelian Law, how plants grow, and what makes a good soil; he should have a comprehension of the effect of soil on civilization, and of the arguments for and against the Malthusian theory.

The purpose of an academic education is not the imparting of information but rather the discipline of the mind together with an acquaintance with some of the eternal truths which are the foundation of our civilization. My contention is that the study of the fundamental axioms of agriculture is as sound a basis for mind training as any of the subjects traditionally found in a liberal arts course—and most necessary in this day and age, lest our so-called educated man lose touch altogether with an important source of our civilization. What the farmer of yesterday, today, and tomorrow needs to know are the underlying principles of agriculture and enough practical skills in the field so that he will be able to use the tools of his calling efficiently. And so I come up with the proposition that an understanding of the fundamental principles of agriculture is an essential part of a liberal education. ****

To sum up them—the type of farmers, together with farming, in Massachusetts is changing rapidly under the stimulus of impelling advancements in science and engineering. No longer should farming be considered a trade, in which skill is the only desirable teaching objective. What appears to be needed *today and tomorrow* is a trained mind and a broad understanding of the fundamentals of agriculture and enough vocational training so that the beginner will have adequate knowledge of farming procedures to make a creditable start. From then on he is on his own. And, finally, that these principles of Agriculture have a place in cultural education.”

Courses described in this catalog will be of particular value to young people who have a sound reason for going into an agricultural business, and who fully realize the usual risks and difficulties that are bound to arise. To more fully acquaint them with both the opportunities and the limitations involved, we are including here an excellent statement taken from the booklet “Agricultural Facts About Massachusetts” published by the Massachusetts Development and Industrial Commission. This was prepared by Louis A. Webster, a former Acting Commissioner of Agriculture of Massachusetts, 1942-44, and at present Director of Markets of the Massachusetts Department of Agriculture.

“Living on the Land and off the Land.—Farm living in Massachusetts, as elsewhere, offers an opportunity to live on the land in nature’s environment and in a position to subsist to a large degree on crops of one’s own production, or literally, “off the land”.

Massachusetts also offers an active, though exacting, market for over a hundred million dollars worth of farm products annually. These products are now grown on 30,000 farms, covering 400,000 acres of cultivated land and a total area of 2,000,000 acres.

It should be pointed out at once that farm products, whether they are for home use or are produced by the carload, are not by any means manna from

heaven. Successful production is the result of constant expenditure of physical and mental toil and the accumulation of generations of experience.

In spite of the industrialization of our State, the war years saw the greatest production of food in the whole three centuries of our experience. About 1,750,000 pounds of food are produced annually from the soil of Massachusetts. This fills 20% of the food needs of our people.

The soil of New England is not as easy to work on the average as in more typically agricultural sections of our country; but that very difficulty of operation has bred a determination to keep intact our heritage. We have probably lost less land by erosion and soil depletion than the nation has as a whole. For generations we have had to feed our soil, so that fertilization is a part of our farm practice and we are prepared to maintain and increase our soil fertility.

Due to our proximity to markets and to the size of our farms, it is naturally unprofitable to raise grain, beef, pork or fibre crops in large volume. It is desirable and necessary for us to specialize in the intensive production of such valuable crops as milk, eggs, fruit, vegetables and flowers. The crops we grow are the so-called "protective foods" that maintain our health and stamina in a vigorous climate and in an active and aggressive social order.

Massachusetts has some of the best purebred dairy herds in the world. We have some of the heaviest producing poultry flocks in existence; and our production of eggs has increased from 20,000,000 dozen in 1930 to 62,000,000 dozen in 1943. The Massachusetts apple crop totals about 3,500,000 bushels which is just enough for our own use. 500,000 barrels of cranberries a year are grown in the Bay State, accounting for 60% of the nation's total. Massachusetts vegetable growers, large and small, produce 17,000,000 bushels of vegetables yearly. Opportunities for expansion will increase when thousands of local growers produce crops for immediate freezing in hundreds of thousands of private freezers.

Thousands of acres of Massachusetts land in the Connecticut Valley, on Cape Cod and in scores of other localities have only been scratched in their possibilities for food production. Massachusetts soil is ready to add stability to the economy of thousands of part-time farmers, and to produce thousands of tons more food for our four and a third million people.

Agricultural effort has been well repaid in Massachusetts, but wealth from the soil is not released without great skill and effort. The soil is a faithful silent partner but demands aggressive and constant cooperation."

— AGRICULTURE IS BIG BUSINESS —

Few farm people and comparatively few other citizens realize the importance of agriculture in this commonwealth of ours according to Willard A. Munson, director of the University of Massachusetts Extension Service.

Massachusetts is an urban, industrial state; 90 per cent of its people live in urban centers. However, 95 per cent of the land area is rural countryside. Here 10 per cent of the population lives, but only about one-third of these are actually engaged in agriculture. In spite of this small number agriculture is a big business. It is the third largest industry in the state, outranked only by leather and textiles. The farm industry in Massachusetts represents an investment of over \$330,000,000 and in 1946 produced a gross income of approximately \$175,000,000.

In addition to the 3 per cent engaged directly in agricultural production 3 to 4 per cent are in allied industries. In other words these people are serving farmers by obtaining farm supplies and services, and by providing marketing facilities. This means approximately 100,000 jobs with 3,000 to 5,000 replacements each year in order to maintain the industry.

CALENDAR

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

1950

October 2, Monday	Freshman Registration
October 3, Tuesday	Senior Registration
October 4, Wednesday, 8:00 A.M.	First Semester begins for Freshmen and Seniors
October 4, Wednesday, 11:00 A.M.	Opening Convocation
October 12, Thursday	Holiday, Columbus Day
November 11, Saturday	Holiday, Armistice Day
November 22-27, Wednesday, 12:00 M. to Monday, 8:00 A.M.	Thanksgiving Recess
December 16-January 3, 1951, Saturday, 12:00 M. to Wednesday, 8:00 A.M.	Christmas Recess

1951

January 3, Wednesday, 8:00 A.M.	Classes Resume
January 29-31, Monday to Wednesday, 5:00 P.M.	Final Examinations
January 31, Wednesday, 5:00 P.M.	First Semester Ends
February 5, Monday, 8:00 A.M.	Second Semester begins
February 22, Thursday	Holiday, Washington's Birthday
March 3, Saturday, 12:00 M.	Second Semester ends for Poultry Majors
March 5, Monday	Placement begins for Poultry Students
March 31, Saturday, 12:00 M.	Second Semester ends for all courses except Food Management and Forestry
April 2, Monday	Placement begins for all majors except Food Management and Forestry
March 31-April 9, Saturday, 12:00 M. to Monday, 8:00 A.M.	Spring Recess
April 9, Monday, 8:00 A.M.	Classes Resume
April 19, Thursday	Holiday, Patriot's Day
May 21-24, Monday to Thursday	Final Examinations
May 25-27, Friday to Sunday	Commencement

THE TRUSTEES

Organization of 1950

MEMBERS OF THE BOARD

	TERM EXPIRES
MRS. ELIZABETH LAURA MCNAMARA of Cambridge	1951
LEONARD CARMICHAEL of Medford	1951
MRS. JOSEPH SWAN LEACH of Walpole	1952
RALPH FRED TABER of West Newton	1952
JOHN M. DEELY of Lee	1953
CLIFFORD CHESLEY HUBBARD of Mansfield	1953
HARRY DUNLAP BROWN of Billerica	1954
JOHN WILLIAM HAIGIS of Greenfield	1954
JOSEPH WARREN BARTLETT of Boston	1955
PHILIP FERRY WHITMORE of Sunderland	1955
WILLIAM MICHAEL CASHIN of Milton	1956
WILLIAM AYLOTT ORTON of Northampton	1956
ALDEN CHASE BRETT of Belmont	1957
ERNEST HOFTYZER of Wellesley	1957

MEMBERS EX-OFFICIO

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 RALPH ALBERT VAN METER, *President of the University*
 JOHN J. DESMOND, JR., *Commissioner of Education*
 JOHN CHANDLER, *Commissioner of Agriculture*

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 ROBERT DORMAN HAWLEY of Amherst, *Treasurer*

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WILLIAM L. MACHMER, A.M., D.Ed.
Dean of the University

JAMES W. BURKE, B.S.
Secretary of the University

ROBERT D. HAWLEY, M.B.A.
Treasurer of the University

BASIL B. WOOD, A.B.
Librarian of the University

ROLAND H. VERBECK, B.S.
Director of Short Courses

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Director ROLAND H. VERBECK, Chairman
Director of Placement Training EMORY E. GRAYSON
Professor ROLLIN H. BARRETT
Professor LYLE L. BLUNDELL
Professor ROBERT P. HOLDSWORTH
Professor GRANT B. SNYDER
Professor HERBERT N. STAPLETON
Associate Professor LAWRENCE S. DICKINSON
Associate Professor RICHARD C. FOLEY

Assistant Professor LUTHER BANTA, Sec'y.
Assistant Professor S. CHURCH HUBBARD
Assistant Professor OTTO G. KRANZ
Assistant Professor HARRY G. LINDQUIST
Assistant Professor ROBERT C. PERRIELLO
Assistant Professor OLIVER C. ROBERTS
Assistant Professor CHARLES H. THAYER

THE FACULTY OF INSTRUCTION

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Instructor in Mathematics

DORIC ALVIANI, M.Ed. Memorial Hall
Assistant Professor of Music

JAMES F. ANDERSON, M.S. French Hall
Instructor in Pomology

OSCAR G. ANDERSON, B.S. French Hall
Assistant Professor of Pomology

WALTER M. BANFIELD, Ph.D. Clark Hall
Assistant Professor of Botany

LUTHER BANTA, B.S. Stockbridge Hall
Assistant Professor of Poultry Husbandry

ROLLIN H. BARRETT, M.S. Stockbridge Hall
Professor of Farm Management

LYLE L. BLUNDELL, B.S. Wilder Hall
Professor of Horticulture

JAMES W. CALLAHAN, B.S. Stockbridge Hall
Instructor in Agricultural Economics

ALTON B. COLE, M.F. Forestry Building
Instructor in Forestry

MRS. GLADYS M. COOK, M.S. Edna Skinner Hall
Assistant Professor of Home Economics

GEOFFREY S. CORNISH, B.S. Stockbridge Hall
Instructor in Agrostology

WILLIAM A. COWAN, B.S. Stockbridge Hall
Assistant Professor of Animal Husbandry

HELEN CURTIS, A.M. South College
Dean of Women

ELEANOR D. DAUTE, M.D. Infirmary
Assistant Professor of Hygiene

DOROTHY DAVIS, M.A. Edna Skinner Hall
Instructor in Home Economics

LLEWELLYN L. DERBY, B.S. Physical Education Building
Assistant Professor of Physical Education

LAWRENCE S. DICKINSON, M.S. Stockbridge Hall
Associate Professor of Agrostology

CHARLES N. DUBOIS, M.A. Chapel
Assistant Professor of English

CHARLES W. DUNHAM, B.S. French Hall
Instructor in Floriculture

J. MURRAY ELLIOT, M.Sci. Stockbridge Hall
Instructor in Animal Husbandry

JOHN N. EVERSON, M.S. Stockbridge Hall
Assistant Professor of Agronomy

GORDON FIELD, M.S. Fernald Hall
Instructor in Entomology

EUGENE J. FINNEGAN, B.S. <i>Instructor in Dairy Industry</i>	Flint Laboratory
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ARTHUR P. FRENCH, M.S. <i>Professor of Pomology and Plant Breeding; Head of the Department of Pomology</i>	French Hall
CAROL B. GAWTHROP, M.S. <i>Placement Officer for Women</i>	South College
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EMORY E. GRAYSON, B.S. <i>Director of Placement Training</i>	South College
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JOHN F. HANSON, Ph.D. <i>Assistant Professor of Entomology</i>	Fernald Hall
ROBERT P. HOLDSWORTH, M.S. <i>Professor of Forestry and Head of Department</i>	Forestry Building
S. CHURCH HUBBARD <i>Assistant Professor of Floriculture</i>	French Hall
FRED P. JEFFREY, M.S. <i>Professor of Poultry Husbandry and Head of Department</i>	Stockbridge Hall
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WILLIAM B. JOHNSON, B.S. <i>Instructor in Olericulture</i>	French Hall
GORDON S. KING, B.S. <i>Assistant Professor of Arboriculture</i>	Wilder Hall
STEPHEN R. KOSAKOWSKI <i>Instructor in Physical Education</i>	Physical Education Building
THEODORE T. KOZLOWSKI, Ph.D. <i>Professor of Botany and Head of Department</i>	Clark Hall
OTTO G. KRANZ, B.S. <i>Assistant Professor of Food Technology</i>	Draper Hall
EDWARD P. LARKIN, B.S. <i>Instructor in Bacteriology</i>	Marshall Hall
JOHN B. LENTZ, A.B., V.M.D. <i>Professor of Veterinary Science and Head of Department</i>	Paige Laboratory
ARTHUR S. LEVINE, Ph.D. <i>Associate Professor of Food Technology</i>	Food Technology Laboratory
HARRY G. LINDQUIST, M.S. <i>Assistant Professor of Dairy Industry</i>	Flint Laboratory
ADRIAN H. LINDSEY, Ph.D. <i>Professor of Agricultural Economics and Head of Department of Agricultural Economics and Farm Management</i>	Stockbridge Hall
WILLIAM P. MACCONNELL, M.F. <i>Instructor in Forestry</i>	Forestry Building
MINER J. MARKUSON, B.S. <i>Associate Professor of Engineering</i>	Stockbridge Hall
HELEN S. MITCHELL, Ph.D. <i>Dean of School of Home Economics</i>	Edna Skinner Hall
EDWARD A. NEBESKY, M.S. <i>Instructor in Food Technology</i>	Food Technology Laboratory
D. HORACE NELSON, Ph.D. <i>Assistant Professor of Dairy Industry</i>	Flint Laboratory
ARTHUR E. NIEDECK, M.A. <i>Associate Professor of Speech</i>	Chapel
JOHN L. PARSONS, M.S. <i>Instructor in Agronomy</i>	Stockbridge Hall
ROBERT K. PATTERSON, B.S. <i>Instructor in Agricultural Engineering</i>	Engineering Annex
ROBERT C. PERRIELLO, B.S. <i>Assistant Professor of Bacteriology</i>	Marshall Hall Annex
IRVING J. PELUG, B.S. <i>Assistant Professor of Agricultural Engineering</i>	Stockbridge Hall
PAUL N. PROCOPIO, B.S. <i>Instructor in Horticulture</i>	Wilder Hall
GEORGE F. PUSHEE <i>Assistant Professor of Engineering</i>	Stockbridge Hall
ERNEST J. RADCLIFFE, M.D. <i>Professor of Hygiene and Head of Department of Student Health</i>	Physical Education Building
ARNOLD D. RHODES, M.F. <i>Professor of Forestry</i>	Forestry Building
VICTOR A. RICE, M.Agr. <i>Professor of Animal Husbandry; Head of Department; Dean of the University School of Agriculture</i>	Stockbridge Hall

J. HARRY RICH, M.F.	Forestry Building
Associate Professor of Forestry	
OLIVER C. ROBERTS, M.S.	French Hall
Associate Professor of Pomology	
JOSEPH R. ROGERS, JR.	Physical Education Building
Assistant Professor of Physical Education	
DONALD E. ROSS, B.S.	French Hall
Assistant Professor of Floriculture	
WILLIAM C. SANCTUARY, M.S.	Stockbridge Hall
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FRANK R. SHAW, Ph.D.	Fernald Hall
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DALE H. SIELING, Ph.D.	Stockbridge Hall
Professor of Agronomy and Head of Department	
RUSSELL E. SMITH, V.M.D.	Paige Laboratory
Associate Professor of Veterinary Science	
GRANT B. SNYDER, M.S.	French Hall
Professor of Commercial Vegetable Growing and Head of Department	
HERBERT N. STAPLETON, M.S.	Stockbridge Hall
Professor of Agricultural Engineering and Head of Department	
WALTER J. S. STELKOVIS, A.B.	Chapel
Instructor in Speech	
PAUL W. STICKEL, M.F.	Forestry Building
Assistant Professor of Forestry	
HARVEY L. SWEETMAN, Ph.D.	Fernald Hall
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Assistant Professor of Engineering	
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Assistant Professor of Agronomy	
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Professor of Floriculture; Head of Department; Acting Dean of the University School of Horticulture	
JAMES T. TIMBERLAKE, B.S.	Stockbridge Hall
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RUTH J. TOTMAN, M.Ed.	Drill Hall
Associate Professor and Director of Physical Education for Women	
REUBEN E. TRIPPENSEE, Ph.D.	Forestry Building
Professor of Wildlife Management	
ALDEN P. TUTTLE, M.S.	French Hall
Assistant Professor of Commercial Vegetable Growing	
JOHN H. VONDELL	Stockbridge Hall
Assistant Professor of Poultry Husbandry	
MRS. MARTHA R. WRIGHT, B.S.	Chapel
Instructor in English	
ANTHONY W. ZAITZ, M.A.	Chapel
Instructor in Speech	
JOHN M. ZAK, M.S.	Stockbridge Hall
Instructor in Agronomy	



MEMORIAL HALL

*Erected in memory of the "Loyal Sons of Old Massachusetts"
who died in World War I.*

*"We Will Keep Faith With You Who Lie Asleep."
(inscription on east facade)*

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

The Stockbridge School of Agriculture is the vocational non-degree department of the University providing training of post high school grade in agriculture, horticulture, and related business activities. In October 1946, two-year short courses were resumed after terminating in June 1943 when war conditions forced a change to a one year emergency program for 1944 and 1945.

Courses are planned to be of maximum use for the returning service man or woman who may be eligible for rehabilitation training under Public Law 16 because of war injuries. They will also be useful to the non-disabled veteran, eligible for further schooling under the G. I. Bill, Public Law 346, and who is interested in training himself for a successful agricultural business in the shortest possible time.

Eleven programs of study are offered, one of which must be selected by each student and completed as specified for the school diploma. The present list of offerings includes:

School of Agriculture

- | | | |
|----|-----------------------------|---------------|
| 1. | Animal Husbandry | (see page 25) |
| 2. | Dairy Industry | (see page 28) |
| 3. | Poultry Husbandry | (see page 32) |

School of Horticulture

- | | | |
|----|--|---------------|
| 1. | Arboriculture | (see page 36) |
| 2. | Commercial Vegetable Growing | (see page 39) |
| 3. | Floriculture | (see page 42) |
| 4. | Food Management | (see page 46) |
| 5. | Forestry | (see page 52) |
| 6. | Fruit Growing | (see page 56) |
| 7. | Ornamental Horticulture | (see page 61) |
| 8. | Turf Maintenance | (see page 64) |

Since its organization in 1918 at the request of the Massachusetts Legislature the school has registered more than 3,000 students and graduated twenty-eight classes. The value of this kind of concentrated, technical schooling, aiming directly toward preparation for a definite field of work, is amply demonstrated by the successful careers of our graduates.

It is estimated about fifteen hundred farms change ownership each year in Massachusetts due to death, infirmity of age, disabling accident, or, in some few cases, just plain inefficient management. Farms will always need to have reliable sources of skilled workers and owner replacements, as war food shortages have so clearly proved, if New England crop production is to be successfully maintained on an adequate scale. This is both a challenge and an opportunity to young men and women.

General Information

Entrance Conditions:—The school program is open to any student who is seventeen years old or over and who has completed a secondary school course or its equivalent, but some major courses do require personal interviews with applicants to insure proper qualifications. All eleven programs of study have limited enrolment quotas which cannot be exceeded because placement, employment, or teaching facilities will not permit a larger student registration. There are no formal entrance examinations.

The Stockbridge School of Agriculture is not intended to divert students at present enrolled in high schools. Such students should complete the high school course if possible, since standard of class work required is practically equivalent to junior college grade.

How to Enrol.—Civilians: Fill out application blank, Form I, page 77, giving all information requested. Be sure to indicate course you wish to elect. Mail this form, with citizenship certificate, Form II, on same page, to Director of

Short Courses. If application is accepted you will be notified, and certificate of citizenship will be kept on file until you register.

Veterans:—Only citizens of Massachusetts are eligible under present limited enrolments due to crowded facilities in most courses. Because many class quotas are filled well in advance of registration, it is urged that veterans arrange for a personal interview at the Short Course Office before filing application for entrance. If and when accepted for entrance, veterans must be sure to comply with the following rules:

(1) Bring photostatic copy of discharge at time of registration if Army or Marine Corps personnel. If Navy, bring photostatic copy of your 553 form. If you have Certificate of Eligibility and Entitlement from the Veterans Administration, bring that. (2) If you have had previous schooling or on-the-job training under Veterans Administration (not here), a Supplemental Certificate of Eligibility and Entitlement must be secured from the Veterans Administration Office having your record after filing with them letter of acceptance from this office. (3) If married, you must present a marriage certificate from city or town clerk's office. If there are any dependents you must be sure to file Veterans Administration Form 509 at your nearest Veterans Administration contact office. (4) If a disabled veteran seeking training under Public Law 16, you must file Veterans Administration Form 1900 received at time of pension award at any Veterans Administration Office.

Registration.—Registration for freshmen will be held on Monday, October 2 and for seniors on Tuesday, October 3. All freshmen students should be on campus from the day of registration until classes open on Wednesday, to meet required appointments for physical examinations.

Instruction.—Instruction is given by the University teaching staff through classroom teaching, laboratory exercises and practical work. The work of the classroom is supplemented by demonstration work in the barns, dairy plant, greenhouses, orchards, university gardens, engineering shops, quick freezing plant, canning plant, university forest, sawmill, and abattoir. The courses are planned to offer fundamental information, and to establish the underlying reasons as well as the special methods employed in the various operations. The combined advantages of university instruction and a university plant with all its varied resources are thus made available to young men and women training for successful business careers in agricultural vocations.

The usual University holidays are indicated on calendar, Page 6. First year Arboriculture students register two weeks prior to the starting of regular class work for preliminary training in the use of ropes and climbing. Freshmen Poultry students complete only one month of the second semester because early placement is required by employers. Other freshman classes continue to April first, when most students are assigned to placement jobs, excepting Food Management and Forestry freshmen who complete two full semesters. Class work is required at the University in the months of October to March inclusive; placement training for practical experience on jobs away from the University, on a wage basis, is required of all first year students from April to September inclusive, with exceptions noted.

Diploma Requirements.—In order to obtain a diploma a student must complete satisfactorily the entire program of study in which he has registered. A student failing to pass the requirements of summer placement training, after a suitable job has been assigned him, is not eligible for graduation until this deficiency is made up, and may not be allowed to enrol for the second year, if the Director of Placement Service considers his record to be unsatisfactory.

Transfer Credits.—Graduation from the Stockbridge School of Agriculture does not fulfill the requirements for entrance in the University degree course, nor are credits earned during the course transferable regularly toward credit for a degree at this University.

Students who make outstanding scholastic and placement records in this two-year course, and whose high school preparation has been satisfactory, may trans-

fer to the same major program in the University with credit allowances of one to two semesters, depending on the individual record. This arrangement is limited strictly to students who meet the stipulated requirements, and each case is considered individually by the Registrar.

Graduation Requirements.—No student will be graduated unless all bills due the University are paid on or before the Wednesday preceding graduation exercises.

Diplomas and letters of honorable dismissal will be withheld from all students who have not paid bills due the University, or legitimate bills due private individuals or business concerns.

A diploma will not be awarded to any senior, if arrears are reported by his fraternity. All bills for second semester, senior year, must be settled not later than the Wednesday before graduation.

Attendance at graduation exercises is required of all seniors before diploma will be awarded.

Seniors who have borrowed from the Goldthwait Loan Fund will have diplomas held as collateral by the University until they have paid up loans in full. This in no way interferes with the privileges of graduation.

Scholarship Regulations.—At the close of each semester students receive a formal report showing the standings given in the subjects pursued by them.

If a student's class average in any subject is below 50, he is failed (F) in the course without final examination privilege and must repeat course with the following class.

If the average of the class grade and the final examination is between 50 and 60, the student is thereby conditioned (#) and must repeat examination only for a pass grade.

Students will be graded by instructors at mid-semester to show general standing and at the end of semester for permanent record. The Faculty Committee will consider all questionable grades after each marking period, and instructors will note on grade reports the names of all students whose work is seriously deficient.

When a student's record indicates failures or uniformly poor work, the Faculty Committee may recommend a close supervision of his work by the faculty adviser in his major course, or, if his scholastic grades disqualify him from further work in the school, he may be asked to withdraw at any time.

A first year student who has deficient scholastic work at the end of the first semester in February in his major courses will not be eligible for placement training until his work meets the required standard.

At the end of any semester a student who is failed or conditioned in more than one course or has conditions in more than two courses may be dismissed.

RULES AND REGULATIONS

Absences from Class

- (1) No unexcused absences will be allowed from classes.
- (2) All excuses for absence shall be presented by the student in writing, and, if approved by the Director, an excuse card will be granted to be signed by the instructor. Excuse cards must be returned promptly to the office when properly signed.
- (3) No excuses will be accepted at the Short Course Office unless presented within two days after the student returns to classes.
- (4) Two tardinesses unexcused shall count as one absence.
- (5) Students presenting excuse cards covering absences are expected to make up all work missed, to the satisfaction of the instructor.
- (6) Instructors are directed to reduce final grades five points for each unexcused absence occurring on a student's record at the end of any semester.
- (7) Absences from classes immediately before or after a holiday are not allowed except by special permission.

- (8) The Short Course Office requires all students to report at once any illness to the University physician, particularly if continued absence from class is likely to result from the illness.
- (9) No illness excuse can be accepted unless accompanied by statement from University health staff, local doctor, or from family.
- (10) Students failing to observe these rules are placed on probation, and may be asked to withdraw from the course if further violations occur.

Absences from Examinations or Tests

Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests.

Student Expenses

Tuition.—A tuition fee of \$50 per semester is charged students, residents of Massachusetts, enrolled in the Stockbridge School of Agriculture. Students who are not residents of Massachusetts are charged a tuition fee of \$200 each semester. The tuition per semester, charged persons not citizens of the United States is \$200. **Students entering from Massachusetts, unless of voting age themselves, are required to file a statement signed by either town or city clerk, stating that the applicant's parent is a legal resident of Massachusetts.** (See Form II in back of catalog.)

Variation in Charges for Three Major Courses

Food Management Course.—Placement jobs in the Food Management Course are not available until after June 1, and students have to complete two semesters of resident study each year.

Poultry Husbandry Course.—Because of earlier placement required on poultry farms, students complete only one and one-quarter semesters of class work here the first year.

Forestry Course.—Two full semesters work the first year followed by four months placement training.

Summary of Expenses Estimated:

	FIRST YEAR		FIRST YEAR (Hotel & Forestry Majors)	SECOND YEAR	FIRST AND SECOND YEARS
	First Semester	Second Semester	Second Semester		Field Trips
Tuition (Citizens of Mass.).....	\$50.00	\$25.00	\$50.00	\$100.00	\$15.00-52.00
(Poultry Majors		12.50)			
Board (University Cafeteria)....	168.00	84.00	168.00	336.00	(Fees listed under Major Programs)
(Poultry Majors		42.00)			
Room Rent (Private Homes)....	72.00	36.00	72.00	144.00	
(Poultry Majors		18.00)			
*Student Fees (Itemized below)..	16.75	11.50	17.00	36.00	
Books, stationery, etc.	35.00	35.00	35.00	70.00	
	\$341.75	\$193.50	\$342.00	\$686.00	\$15.00-52.00
Poultry Majors		117.00			

These figures for board and room are estimates based on prevailing prices and are subject to change when and if conditions change.

*Student Fees:

	FIRST YEAR		FIRST YEAR (Hotel & Forestry Majors)		SECOND YEAR	
	First Semester	Second Semester	First Semester	Second Semester	First Semester	Second Semester
Athletics	\$10.00	\$ 5.00	\$10.00	\$10.00	\$10.00	\$10.00
Class Tax	1.00	1.00	1.00	1.00	1.00	1.00
Collegian	1.00	.50	1.00	1.00	1.00	1.00
Concert Fee	1.50	1.50	1.50	1.50	1.50	1.50
Shorthorn (School Yearbook)....	2.00	3.00	2.00	3.00	3.00	5.00
Stockbridge School Activities	.50	.50	.50	.50	.50	.50
Student Handbook	.75	—	.75	—	—	—
	\$16.75	\$11.50	\$16.75	\$17.00	\$17.00	\$19.00

Advance Payment

New students will be expected to make an advance payment of \$15 to the Treasurer of the University as soon as they are notified by the Director that they are accepted for admission. This will be considered as first payment on registration fees which will be due at time of matriculation in October. It is not refundable and will be considered as payment for admissions and registration expense if the student does not matriculate.

Refunds

A student who leaves the University for any reason before a semester is half completed will have refunded to him one-half the fees paid for that semester, but one who leaves after a semester is half over will be allowed no rebate of fees. There will be no refund of prepaid rent.

When Payments Are Due

In accordance with policy established by the Board of Trustees, all charges for tuition, fees, board and room rent in University dormitories are due at the beginning of each semester and must be paid on or before the opening date of each semester. Bills will be rendered in advance, and payment may best be made by mail. Students may not attend classes until registration charges are paid.

Late Registration

Any student who does not complete his registration, including payment of semester charges on the regular registration days will be required to pay a fine of five dollars.

Rooms

Men Students: Dormitory rooms are available only to students of the four year course. Private homes in the town furnish the chief source of rooms for Stockbridge students under assignment by the University Housing Office. Students are notified prior to registration of their location and should not make earlier inquiry.

Women Students: Women students of the Stockbridge School are housed in University dormitories and have their meals at the University Dining Hall, unless given permission to commute from home. Room rent is approximately \$112 for Freshmen, \$150 for Seniors. Board approximately \$225 for Freshmen, \$340 for Seniors.

Under the supervision of the Dean of Women, life in each dormitory is directed by a council of student leaders, advised by a full-time Housemother, so that conditions in the residence hall are conducive to study and good living habits. Through Women's branch of the Student Government, the responsibility is put upon each student to live according to her own best standards as well as according to the standards of the group.

Room furnishings include mattress and pillow; students furnish bedding, linen, towels, desk lamp and wastebasket. Rooms are cared for by students occupying them.

Dormitories are open at 1:00 o'clock on Sunday preceding Stockbridge registration.

Board

Stockbridge freshmen are not required to secure meals in the University cafeteria, but can do so if it is more convenient.

A number of public restaurants or dining rooms are located close to the University where most students arrange for meal service, usually approximating \$2.00 a day, with allowances made if student goes home on week-ends, class schedule permitting.

A new student should sample the various places to find one suited to his needs, where he can meet with congenial members of his class group.

Books and Supplies

For the convenience of students the University maintains a store service in North Collège. Here all textbooks may be purchased at cost plus transportation charges. Students are informed at the first class session in each course what books are required and must secure individual copies according to order list sent in by instructor.

There is little opportunity to secure secondhand books because most students find the texts assigned of value to retain as reference sources after completing a course.

Student Aid

Students desiring any form of financial aid from the university including scholarship, employment, or loan, are required to file applications with the Student Aid Committee not later than June 10 of each year. Incoming freshmen are allowed an extension of time.

These application forms are used to determine the comparative need of the applicants and are passed on by the Student Aid Committee. No student is eligible for any kind of financial assistance from the University unless he or she has filed the required form and has been certified as deserving by the Student Aid Committee. Application forms may be secured at the Placement Service Office, South College.

The placement training period between the first and second year usually enables a student to earn from \$500 to \$1,000 depending upon his skill and general ability, and the type of work. This will pay a large part of the second year expenses.

Prospective students should understand that the above estimates cover expenses which may be called strictly University expenses, and that there are other financial obligations voluntarily assumed by students which they should expect to meet. Such expenses vary from \$28 to \$36 a year. Additional financial responsibility is also assumed by students joining fraternities or entering into other social activities of the University. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$500 to \$550 for the first year of one and one-half semesters in residence, and \$650 to \$700 for the second year of two semesters.

Student Employment Projects

Part-time work is available for a limited number of candidates. The type of work to which students are assigned consists of the following:

Clerical and office, building and grounds maintenance, farm, greenhouse and orchard duties, helpers in livestock and cattle barns, and other miscellaneous types.

Self Help.—The University does not encourage students to enter without money in the expectation of earning their way entirely. The student will find it better to work and accumulate sufficient funds before coming to the University, or else to take more than two years in completing his course.

No student should undertake work that interferes with his studies, and students should understand that no one may receive a large amount of work at the University.

First year students particularly should not risk failure in their beginning studies by taking on such extra work until they have, at least, tested themselves in the study program of the first semester. It is advised to proceed cautiously in combining both extra work and athletics at the same time, if the student's scholastic record is at all questionable.

The Vincent Goldthwait Loan Fund.—This fund was established by Dr. Joel E. Goldthwait, U. of M. 1885, of Boston, as a memorial to his son who died in 1922 during his junior year at Harvard. Its purpose is to aid worthy senior students who find it difficult to secure adequate finances to complete their final year. Only seniors needing a supplement to funds already available will be

considered. Amounts in excess of \$200.00 are rarely granted and most loans range from \$50 to \$150.00.

A regular promissory note must be executed, endorsed by parent or guardian, and repayment may be made within any reasonable period after graduation up to one year. There is no interest charge.

Wilbur H. H. Ward Scholarships.—The Wilbur H. H. Ward Fund is administered by a Board of Trustees independent of the University. Applicants for these scholarships should write to Sumner R. Parker, who may be addressed at the University. They are available only to Hampshire County boys.

Ascension Farm School Corporation Scholarships.—This Corporation, while no longer operating a special farm school, continues its specific service by providing "care, education and training in agriculture of boys resident in Western Massachusetts," as stated in its charter. Aid is available chiefly to residents of Berkshire County.

Application form should be secured in person from the Director of Short Courses after notice of admission to the Stockbridge School of Agriculture has been received. Scholarships are granted only after final approval by the Board of Trustees and officers of the Corporation.

General Exercises

Assembly exercises are held weekly on Wednesdays, 11:00-12:00 M., and serve to bring together all Stockbridge students for a general program dealing with matters of interest to the University and the School. Among speakers who appear from time to time are the President of the University, members of the University Staff and others who have interesting subject matter to present. This weekly assembly also enables announcements concerning students and student affairs to be presented, and permits class presidents to make advance reservations for business meetings when necessary. **No unexcused absences from this exercise are allowed.**

STUDENT ACTIVITIES

A large number of student organizations furnish opportunity to students for work and leadership.

Memorial Hall is the center of student activities and contains offices for the various student organizations, including the Stockbridge School Student Council. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool and ping pong tables; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in World War I.

For those students who play musical instruments there are opportunities with the University Orchestra and the University Band.

Student Council.—The Stockbridge School Council is composed of representatives of the first and second year classes. This body serves as a general committee on student government and helps to maintain the best traditions and customs of the school.

Shorthorn.—A student yearbook called "The Shorthorn" is published annually by the members of the graduating class, and is usually issued in June. All students subscribe to it.

Fraternities.—There are two Stockbridge fraternities for men in the student body, Alpha Tau Gamma and Kappa Kappa, both owning houses, serving as social and residential centers for their groups. For the small group of women students there is a Tri Sigma Club.

Scholastic Society

A Stockbridge Honorary Scholastic Society called "Stosag" was established in 1935 to encourage high scholarship. Students whose records show no grade below 70 in any subject and whose average for the first three semesters is 85 or

better, are elected to membership in the society each June. Engraved certificates are awarded to members of the graduating class who have achieved this distinction.

Athletics and Physical Education.—The School has its own separate athletic program with regular schedules in football, basketball, ice hockey, cross-country and winter track. Sweaters and insignia are awarded to team members and managers in these sports. The official insignia is the letter S.

The football team plays a schedule of 6-7 games with preparatory school teams. The basketball team plays a 12 game schedule; the cross-country team usually runs 3 races, while 2 or 3 meets are scheduled for the winter track squad. Ice hockey affords 6 to 8 games depending on the weather.

Due to the fact that freshmen are on placement training during the spring term which leaves only seniors available, no regular team is maintained in baseball. Men desiring to play are organized into teams and an intramural league is arranged.

This athletic program is entirely under the supervision and direction of the Athletic Department of the University and coaches are provided for all sports. Instructor Stephen R. Kosakowski, director of the Stockbridge physical education work, is coach of football, basketball, hockey, and has charge of the spring recreation program. Assistant Professor Llewellyn L. Derby, coach of the varsity track team, has charge of the cross-country.

All students are urged to participate in some sport each semester, but first year students should be sure all studies are well maintained. No squads are reduced by eliminating the inexperienced players, and everyone is given an opportunity to play in games. The football squads in the past have consisted of approximately 50 candidates. Games have been scheduled for both the second and third teams so that every man on the squad has participated in an outside scheduled game. Both the first and second teams in basketball have regularly scheduled games and an intramural league schedule is arranged for those not playing on the first squad.

Every care is exercised to guard against men overtaking their strength in any sport or game to the detriment of their health. No man whose physical condition is at all questionable is allowed to play on the teams. A careful check is maintained by required physical examinations for all students given by the University physician at the opening of the school year. A second examination is made of each man before permission is granted to participate in any sport.

Students also subscribe to the university varsity games and have attendance privileges for varsity sports on the campus.

Class work in physical education for men not on athletic squads is required for both seniors and freshmen during the first semester. This consists of 2 class periods a week. The object of this course is to give the men some knowledge of games which may be of value to them in after school days, as well as to give every man an opportunity to develop sufficient control over his body to enable him to get pleasure from physical activities and to establish correct health habits.

The freshmen receive instruction in softball, touch football, and swimming. Men may elect football or cross-country, instead of the regular class work. The seniors take up volleyball, badminton, and swimming. They may also elect football or cross-country. The classes are organized into teams which compete against each other with much rivalry. Students are expected to wear old clothes during the play period, and shower baths are required at the close of each class period.

A physical education building containing a swimming pool, a great indoor cage 150 by 180 feet for all kinds of sports and games, and complete locker room and shower bath facilities provide ample equipment to carry out this program. Individual equipment is supplied to all members of the football, hockey, basketball, cross-country, and track squads.

STUDENT RELATIONS

The customary high standard of university men in honor, manliness, self-respect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or persistent violation of rules must be reported by the instructor to the Director for discipline.

The privileges of the university may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the university, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined, but he may be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet if in the judgment of the university authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

HEALTH SERVICE

The University endeavors to safeguard the health of all students while on the campus and for this purpose maintains a Department of Student Health, staffed by two physicians, five resident registered nurses, and operates a group of three Infirmary buildings.

- (1) Physical examination by the Health Service is required of all undergraduate students on entrance, or more often if indicated. This examination is given to freshmen during matriculation week. *Evidence of a successful smallpox vaccination is required.*
- (2) The Student Health physicians have offices in the Physical Education building and in the Out-Patient Building, where they may be consulted during university hours.
- (3) The Infirmary consists of three buildings on East side of campus, near Marshall Hall, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by one of the Student Health physicians.
Out-patient hours are: Week days 9:00-11:30 a.m., 1:00-5:00 p.m. Saturdays 9:00-11:30 a.m.
- (4) Students are urged to consult the resident physicians at the first sign of physical disorder, and for minor accidents. Many severe illnesses and much lost time can be avoided by early or preventive treatment.
- (5) A Trustee ruling grants free time in the Infirmary — when necessary for treatment — up to seven days in the school year. This free time applies to regularly enrolled undergraduate students only. For time in excess of seven days or for other bed patients, a charge of \$4.00 per day is made against the patient.
- (6) In addition to the charges specified in paragraph 5, the following additional expenses will be charged to the patient.
 - (a) *Nurses.* — In case a special nurse is required for the proper care of an individual the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the chief resident nurse.
 - (b) *Professional Service.* — If a student requires continuous medical attention by a physician, he may be required to select a town physician and becomes responsible for fees charged by that physician.

- (c) *Supplies.* — Special medical supplies prescribed by a physician will be charged to the patient.

GOODELL LIBRARY

This fine building completed in 1935 houses the University Library. This library contains one of the best collections in agriculture and related sciences in the country, with special strength in entomology, botany, chemistry, horticulture, landscape architecture, soil science and animal husbandry, but with large collections, also in literature, history, economics and sociology. There are over 151,000 bound books, and over 50,000 classified pamphlets giving most recent information. The periodical file contains over 800 current magazines, both scientific and popular, and a careful selection of periodical publications of learned societies. The Library is unusually rich in files of journals and publications of Experiment Stations. The Library is open from 7:45 A.M. until 10:00 P.M., Monday through Friday, and from 7:45 A.M. until 5:00 P.M., Saturdays. Sundays the Library is open from 1:45 to 4:45 P.M. and 7:00 to 10:00 P.M.

The building is named in memory of Henry Hill Goodell, President of the University from 1886 to 1904 and Librarian from 1886 to 1898.

AGRICULTURAL OPPORTUNITIES FOR WOMEN

Agriculture is a field in which women have always found some opportunity. There are women farming independently in all branches of agriculture. As a rule poultry raising, small fruits and vegetable growing and floriculture, seem to offer women an easier opportunity than dairy, stock, and general farming. Women are also occasionally finding some paid positions which include farm and estate workers, and rarely managers. There are from time to time some positions available as garden service workers, and as agricultural officers in state correctional institutions.

For the woman or girl whose home is already upon the farm the opportunity is better. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she may be able to carry on and develop a profitable enterprise of her own. The Stockbridge School of Agriculture offers to the women who wish to engage in farming the practical training which they will need to fit for such work.

Women who are interested in taking agricultural courses should correspond with Miss Carol Gawthrop, Placement Officer for Women.

POSITIONS

The University does not guarantee positions to students registered in any of its courses, but through the Placement Service it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and experience, and of his success in positions for which he has been recommended after he has finished his course. Opportunities for trained men and women, especially those who have had experience, are good.

A student desiring a recommendation from the university must meet the following conditions:—

- (1) He must be of good character.
- (2) His previous record must be good.
- (3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of practical experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

VOCATIONAL PLACEMENT

The work of locating first year students for apprentice training from April to October, after the resident term is completed, is in charge of the Director of

Placement Service. Placement training for women students is in charge of Miss Carol Burr Gawthrop of the Placement Office. Every effort is made to secure satisfactory positions affording the kind of training desired by the student, but the Placement Office cannot guarantee to place every student for training, when positions are not available. In normal times placement positions are secured for all students who are eligible under these conditions.

1. Positions are secured that will enable a student to gain practical experience in his particular vocation.
2. A student desiring placement at home may arrange for such assignment if the Director of Placement approves. As a rule, it will be found more desirable for a student to spend this six months away from home even though he plans to be employed there after finishing the course. This statement is based on the experience of students who have already taken the course. The parent must request in writing, placement on the home project.
3. If credit is to be secured for the six months' placement training the following rules must be carefully observed.

Rules for Stockbridge Students on Placement

1. The student must interview the Director of Placement early in his first year in order that his qualifications, the type of work he wishes to pursue, and his general fitness may be determined.
2. No final arrangement for placement training may be made by the student himself until the Director of Placement has been consulted.
3. Students are required to complete their period of training without unnecessary absences.
4. No transfers are to be made by a student if he is to receive credit, until permission has been had from the Director of Placement.
5. A position may not be given up by the student until the Director of Placement has been notified.
6. A monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period.
7. Students must satisfactorily complete all reports as required by the various departments.
8. When a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year.
9. All students are given a thorough physical examination by the Department of Physical Education at the beginning of each university year. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate, and parents' approval.

It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

THE LOTTA AGRICULTURAL FUND FOR GRADUATES ENTERING AGRICULTURAL PURSUITS

(Prepared by the Lotta M. Crabtree University Committee with the approval of the Trustees of the Lotta M. Crabtree Estate.)

A 1940 decision of the Probate Court of Norfolk County made available the Lotta M. Crabtree Agricultural Funds to graduates of the Stockbridge School of Agriculture, as well as to graduates of the four-year course at the University of Massachusetts. This decision does not, however, lessen the restrictions or change the purposes for which these funds can be used for farm financing.

The purpose of loans from these funds is to assist meritorious graduates who are without means in establishing themselves in agricultural pursuits. These loans are made without interest or service charges other than the cost of title search and legal papers. They must, however, be paid back in full amount within a reasonable length of time and there are certain restrictions on their use.

To avoid disappointment on the part of applicants and save unnecessary work and expense in investigating applications for loans, there are certain questions that the prospective borrower should answer for himself before making application for a Crabtree loan. The more important of these follow:

1. Am I thoroughly qualified, both in training and experience, to successfully manage the project that I am planning? Experience on a farm or in the agricultural enterprise contemplated, in addition to classroom training is one of the first essentials for success. If such experience is lacking, it is usually best to delay application for a loan until acquired.

2. Is the project that I seek assistance in financing really an "agricultural pursuit"?

3. Am I using these funds entirely to establish myself in business or are they being used in part to benefit some other person who is not a graduate of the University of Massachusetts or the Stockbridge School? This question sometimes arises in connection with "family" and "partnership" propositions. It has no reference to a wife or other dependent but no part of the loan can be used to finance a person who is not a University or Stockbridge graduate.

4. Am I using these funds for refinancing present debts? The purpose of these loans is to "establish" rather than "reestablish" persons in agricultural pursuits. They cannot be used for retiring present debts.

5. Will the amount that I can hope to borrow from these funds adequately finance the enterprise that I am planning to engage in? Lotta Agricultural loans are used mostly to supplement other forms of financing rather than for complete financing of farming operations. Reasonably definite plans for the other financing, which the loan is intended to supplement, should be worked out before applying for a Crabtree loan.

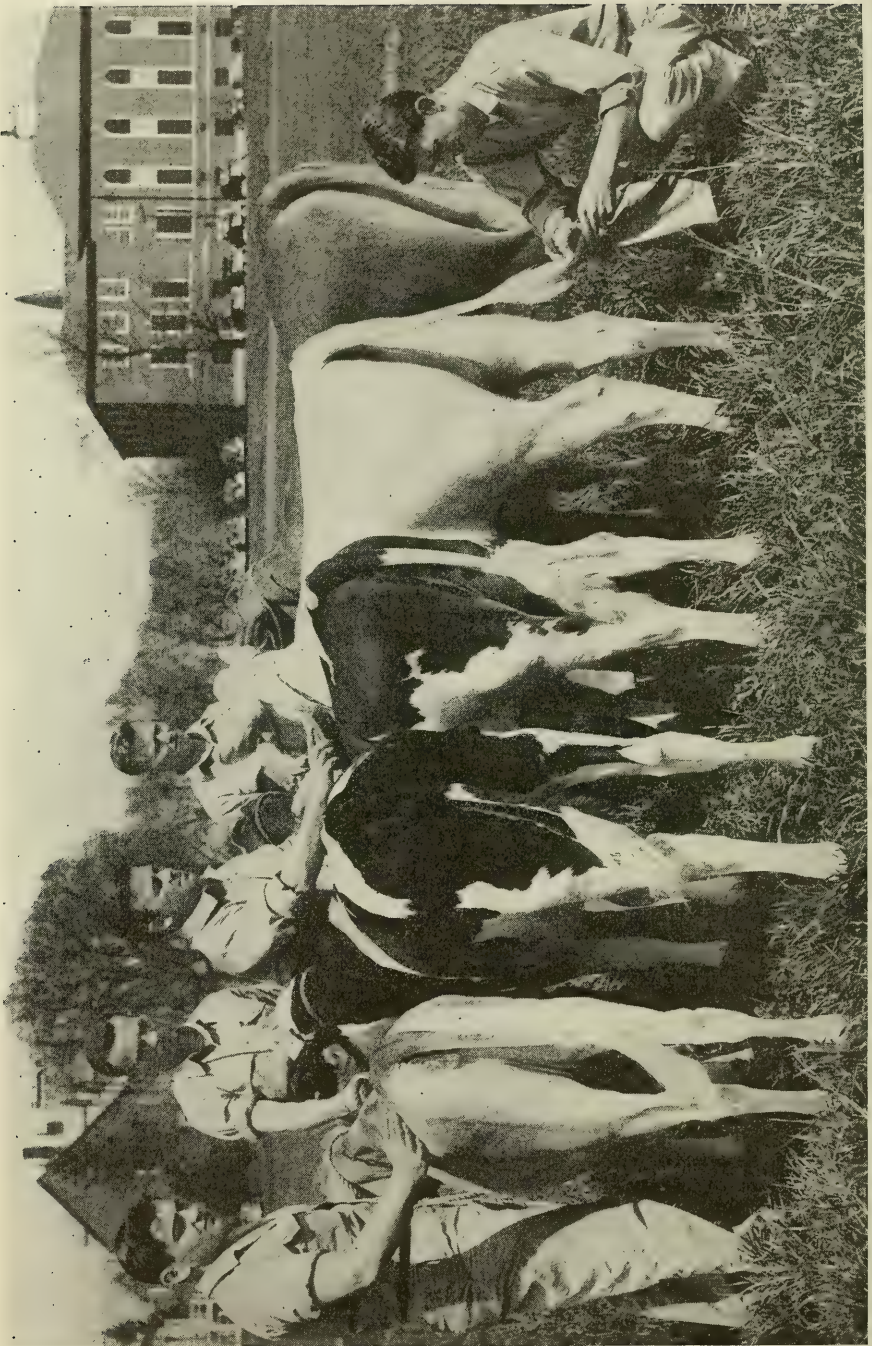
6. What can I offer as security to adequately safeguard this loan? A Crabtree loan, like any other loan, should be safeguarded against possible death or financial failure of the recipient. While character and personal integrity of the applicant are large factors in decisions relative to granting of a loan, adequate security should be provided as far as possible.

7. Can I amortize my debt payments and other financial obligations so that I can repay this loan within a reasonable period of time? Most Crabtree loan are made under definite agreement to repay within a relatively short period of years. The Crabtree applicant should therefore make certain, barring calamity, that his income above necessary operating and living expenses will be great enough to allow annual, semi-annual or monthly payments on this loan as well as on other debt obligations that he may be carrying.

8. Will this loan actually help me to make more money or will it merely delay the time and increase the burden of final financial reckoning? The answer to this question and also to No. 7 involves careful budgeting and planning ahead. Unless an applicant can show on paper by carefully projected

plans and budgets of expected receipts and expenses that he will benefit by a loan, he is likely to have difficulty in repaying it.

Applications for the "Lotta Agricultural Fund" should be addressed to the Trustees of the Lotta M. Crabtree Estate, 619 Washington Street, Boston, Massachusetts, or may be secured at the Short Course Office or the Placement Office at the University. The Director of Placement has been designated as the Stockbridge representative on the faculty committee which makes approval recommendations to the Crabtree trustees. Decisions regarding the granting of a loan rest entirely with the Trustees under the terms of Miss Crabtree's will.



ANIMAL HUSBANDRY

PROFESSOR RICE, ASSOCIATE PROFESSOR FOLEY, ASSISTANT PROFESSOR COWAN,
ASSISTANT PROFESSOR HALE, MR. TIMBERLAKE, MR. J. MURRAY ELLIOT

Animal Husbandry, in this School, refers to the breeding, feeding, and management of dairy cattle, beef cattle, horses, sheep and swine.

The purposes of the courses in Animal Husbandry are (1) to provide the student with a thorough understanding of the basic principles involved in the creation of more efficient and more beautiful animal types, said principles being those involved in the biology of animal reproduction, the chemistry of animal growth and feeding and the economics of livestock production; (2) to show the practical workings of these principles in the selection, feeding and management of the various classes of livestock and (3) to provide practice in judging, fitting, showing and general management of livestock as well as the production of milk and other products, and the slaughtering, curing and marketing of meat products.

The University dairy herd comprises about 150 animals in the Ayrshire, Guernsey, Holstein, Jersey and Milking Shorthorn breeds. In beef cattle, we maintain a herd of Aberdeen-Angus and a herd of Herefords; in sheep, flocks of Southdowns and Shropshires; in swine, a herd of Chester Whites; and in horses, a band of Percheron mares and stallions as well as one stallion and several mares and foals in the light horse breeds. Modern barns house the above animals and modern equipment is available for practice work with them.

The University Farm of about 250 acres is handled primarily as a live stock farm, producing, pasture, hays, silages and some grain for live stock feeding. The farm is equipped with the most up-to-date machinery for agricultural production. The farm and barns are our laboratories, the animals and accessories our equipment.

The Charles H. Hood Dairy Foundation Prize for Animal Husbandry Seniors

The Charles H. Hood Dairy Foundation Prize of \$200 is awarded annually to three seniors who in the judgment of a special faculty committee has made an outstanding scholastic record in this major course and who because of their practical qualifications, personality, and character, seem best qualified for success in this field.

The first prize is \$100, the second \$60, and the third \$40.

Trains for Jobs Like These:

Owners and operators of dairy farms; farm managers; superintendents or foremen; herdsman in various kinds of livestock enterprises; dairy herd association testers; inseminators in artificial breeding units; businesses allied to agriculture such as farm cooperative fieldmen, sales and service men for feed, fertilizer and farm machinery companies.

Field trips will be required during the two years at an estimated cost of \$40 per student.

Special equipment needed for students in Animal Husbandry are: knives, boots, and wash suits, at an estimated cost of \$15.

Animal Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S3 (Marketing)
Agronomy S1 (Soil Management)
Animal Husbandry S1 (Principles of Feeding)
Bacteriology S1 (Bacteriology and Rural Hygiene)
Dairy S1 (General Dairying)
Farm Management S3 (Efficiency in Farming Operations)
Physical Education S1 (Required of men students not participating in football; also required of women students.)
Milking (Practice periods only, by arrangement)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
Agricultural Engineering S4 (Farm Shop)
Agronomy S2 (Fertilizers)
Animal Husbandry S2 (Types and Breeds)
Fruit Growing S10 (General Course)
Poultry Husbandry S10 (General Course)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Power)
 Animal Husbandry S3 (Animal Breeding)
 Animal Husbandry S5 (Farm Meats)
 Business English S1
 Farm Management S1 (Farm Management and Accounts)
 Public Speaking S1
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S10 (Farm Structures and Drainage)
 Agronomy S4 (Field Crops)
 Animal Husbandry S4 (Live Stock Production)
 Animal Husbandry S6 (Dairy Cattle and Milk Production)
 Public Speaking S2
 Veterinary Science S2 (Applied Animal Sanitary Science)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

ANIMAL HUSBANDRY S-1. (Principles of Feeding) I.

This course includes a study of the organs of digestion, the digestion and absorption of feeds, the classification and characteristics of the common feed-stuffs, the utilization of feeds in maintenance, growth, fattening; meat, work and milk production. Some time will be spent on the importance of minerals and vitamins. Methods of calculating balanced rations; feeding standards, and feeding practices will be studied. A visit to a feed mill is a requirement of this course.

3 class hours and 1 2-hour laboratory period a week.

Credit, 4.
 MR. ELLIOT.

ANIMAL HUSBANDRY S-2. (Types and Breeds) II.

This course considers the origin, history, development, characteristics and distribution of the breeds of cattle, sheep, swine and horses commercially important in the United States. The conditions to which each class of live stock and each breed seem best adapted will be discussed. Laboratory work consists of judging and evaluating as many rings of dairy, dual-purpose, beef cattle, sheep, swine and draft horses as time permits.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.
 MR. TIMBERLAKE.

ANIMAL HUSBANDRY S-3. (Animal Breeding) I.

This course is planned to acquaint the student with the facts of reproductive physiology, with the facts and theories of modern genetics, and to show how such knowledge may be utilized through genetic analyses, selection, and systems of breeding for the creation of more beautiful and more efficient animal types. A field trip is made to the Massachusetts Selecting Breeding Association.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.
 ASSISTANT PROFESSOR COWAN.

ANIMAL HUSBANDRY S-4. (Live Stock Production) II.

This course deals briefly with the problems of selection, breeding and care of horses, beef cattle, sheep, and swine, with emphasis on their place in New England agriculture. Attention is given to the general situation, equipment, feeding, and management problems. The laboratory periods consist of practice in fitting and showing, shearing, docking and castrating. As a part of the laboratory work, each student will be assigned an animal for fitting and showing in the "Little International" which will be held on a Saturday in March. Trips to other purebred live stock establishments in New England will be required during the semester. The cost of transportation will not exceed \$5.00. Four students in this course will be selected to participate in the New England two-year school judging contest.

Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2.

3 class hours, 1 2-hour and 1 4-hour laboratory periods a week. Credit, 5.

ASSISTANT PROFESSOR HALE, MR. ELLIOT.

ANIMAL HUSBANDRY S-5. (Farm Meats) I.

This course includes a survey of the packing industry and follows the product (i.e. beef, pork, lamb and veal) from the feed-lot to the consumer's table. Practice is afforded in classifying animals as to market class and grade and in slaughtering, dressing, and cutting beef, pork, lamb and veal. At the end of the course a trip will be taken to several large packing houses in Boston consuming one day and costing about \$10.00. Textbook: Ziegler, "The Meat We Eat."

Special equipment needed for this course includes knives, boots and wash suits, estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. TIMBERLAKE.

ANIMAL HUSBANDRY S-6. (Dairy Cattle and Milk Production) II.

For Seniors.—This course treats all phases of dairy cattle production and management. The student is provided with an opportunity to study and seek the solution to the various economic, nutritional, genetic and managerial problems concerned in successful dairying. Lectures will be supplemented with talks by specialists in the various fields. Laboratory will consist of a detailed study of methods used on the university farm, with practice in the various skills necessary for the herdsman or showman. A dairy cattle judging team will represent the Stockbridge School of Agriculture in the New England two-year school judging contest.

Trips to purebred live stock farms in the state for the purpose of inspection and advanced dairy cattle judging will be required on Saturdays during the spring semester. The cost for transportation will not exceed \$15.00.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.

ASSOCIATE PROFESSOR FOLEY, MR. ELLIOT.

ANIMAL HUSBANDRY S-8. (Food Management Meats) II.

For majors in the Food Management Course. This course is designed to impart a knowledge of the fundamental principles involved in judging, purchasing, and efficiently utilizing meat and meat products. Laboratories will involve actual slaughtering, dressing, wholesale and retail cutting and preparation of by-products. Judging practice will be secured in a near by packer cooler and at the end of the course a one day trip costing \$10.00 will be scheduled to several large packing houses in Boston. Textbook: Ziegler, "The Meat We Eat." Special equipment needed for this course includes knives, boots, and wash suits—estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. ELLIOT.

ANIMAL HUSBANDRY S-9. (Special Dairy Cattle Course) I.

For Dairy Industry and Poultry Husbandry Majors. This course considers briefly the origin, history, development, characteristics and distribution of the six major dairy and dual-purpose breeds of cattle. The course will cover the basic principles of dairy cattle feeding, including feeding standards and the calculation of balanced rations. The principles of genetics and the art of breeding better dairy cattle will be emphasized. Management of the dairy herd for the health standpoint and for profitable returns will complete the lecture portion of the course. Laboratories will be devoted to judging, identification of feeds, and various managerial problems. Textbook: Peterson, "Dairy Science."

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSOCIATE PROFESSOR FOLEY.

Note—Every student in this major must qualify in milking. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied this preliminary requirement.

DAIRY INDUSTRY

PROFESSOR HANKINSON, ASSISTANT PROFESSOR LINDQUIST,

ASSISTANT PROFESSOR NELSON, MR. FINNEGAN

The Dairy Industry course is designed to fit men for positions with market milk concerns, creameries, ice cream plants, and specialized dairy farms.

All dairy industry courses are given in the dairy building (Flint Laboratory), a building devoted especially to dairy work. The building is well equipped with dairy and creamery machinery.

The market milk department contains two complete pasteurizing units, a clarifier, separator, automatic bottle filler and capper, rotary can washer and automatic soaker type bottle washer with conveyor transfer of bottles to the bottle filler and capper.

The ice cream making room contains a pasteurizing vat, homogenizer, cooler, brine and direct expansion freezers, continuous freezer, and additional equipment such as is found in ice cream plants.

The room designed for cheese making is equipped with cheese vats, draining racks, presses, etc. The butter making room contains power churns, workers, scales and other accessories.

The testing laboratories are well equipped with apparatus for the Babcock, Mojonnier, and other tests for the determination of chemical and bacteriological quality of milk products.

Trains for Jobs Like These:

Skilled workers in wholesale and retail dairy plants including laboratory technicians, pasteurizer operators, ice cream mix makers, freezer operators, and fancy form decorators, cheesemakers, salesworkers; also dairy equipment and supply salesmen, fieldmen and Dairy Herd Improvement Association testers. Such training supplemented with sufficient practical experience may lead to positions such as assistant plant superintendents and plant managers.

Field trips will be required during the two years at an estimated cost of \$20 per student.

While working in the dairy laboratories, white suits and rubber footwear are required, at an estimated cost of \$10.00.

Dairy Industry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S1 (Farm Economic Problems)
 Agricultural Economics S5 (Dairy Business Accounting)
 Agricultural Engineering S1 (Farm Power)
 Bacteriology S1 (Bacteriology and Rural Hygiene)
 Dairy S1 (General Dairying)
 Practical Science S7
 Public Speaking S1
 Physical Education S1 (Required of men students not participating in football; also required of women students).

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Dairy S2 (Testing Milk Products)
 Food Technology S2 (Basic Principles and Freezing)
 Food Technology S4 (Special Products)
 Practical Science S8
 Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Animal Husbandry S9 (Special Dairy Cattle Course)
 Business English S1
 Business Management S3
 Dairy S3 (Ice Cream Making, Cheese, and other Milk Products)
 Dairy S5 (Judging Dairy Products)
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S2 (Marketing)
 Agricultural Engineering S6 (Dairy Mechanics)
 Bacteriology S4 (Dairy Bacteriology)
 Dairy S4 (Market Milk and Butter Making)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

DAIRY S-1. (General Dairying) I.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent in fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, Herd Improvement Associations, advanced registry work; the handling of market milk; soft cheese making, ice cream making, and butter making as applied to general farm conditions. The laboratory work consists in testing milk and dairy products for butter fat, solids, and acidity, together with some dairy plant experience in milk handling, butter making, cheese making, and ice cream making.

2 class hours and 1 2-hour laboratory period a week.

CREDIT, 3.

ASSISTANT PROFESSOR LINDQUIST.

DAIRY S-2. (Testing Milk Products) II.

In this course a study is made of the common tests used in dairy industry processes.

The lectures in this course include a discussion of the application of tests, what they indicate and their importance in the dairy plant.

The laboratory work consists of a study of the various dairy laboratory tests such as sediment, flavor, and total solids of milk; moisture, fat and salt determination in butter; moisture test of cheese; the operation of the Mojonnier tester and the modified Babcock tests for fat in dairy products.

In addition to the testing work students will be required to arrange for work about the plant in order to become familiar with dairy plant practices and the operation of dairy machinery.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR NELSON.

DAIRY S-3. (Ice Cream Making, Cheese, and Other Milk Products) I.

This course deals with the making of ice cream, cheese, condensed, evaporated and powdered milk.

The ice cream making portion of the course includes a careful study of modern methods of manufacturing the common frozen dairy products (ice cream, sherbets, ices, frozen puddings, punches, mousses, etc.).

The lecture work includes a discussion of the history of ice cream making, the ingredients found in ice cream, methods of preparing and standardizing mixes, the freezing process, methods of hardening, marketing, and distribution of the finished product.

The laboratory work involves the preparation and standardization of ice cream mixes, the freezing of ice cream and other frozen dairy products, and laboratory tests for butterfat and total solids in ice cream.

In that part of the course dealing with cheese making, a study is made of the different methods of manufacturing hard and soft cheese (cheddar, brick, cream, neufchatel, olive, nut, cottage, cheese spreads, etc.).

In the lectures the manufacture of the different cheeses is considered, either from the standpoint of marketing the entire milk supply of the dairy or as an economical means of disposing of surplus milk. In the laboratory work the different kinds of cheese are made.

Lectures are also given on the manufacture of the various concentrated products as sweetened condensed, evaporated, and powdered milk; casein, semi-solid buttermilk, dried whey, malted milk, etc.

3 class hours and 3 3-hour laboratory periods a week.

Credit, 8.

ASSISTANT PROFESSOR LINDQUIST, ASSISTANT PROFESSOR NELSON,
and Mr. FINNEGAN.

DAIRY S-4. (Market Milk and Butter Making) II.

In that part of the course on market milk, a study of the development of the market milk industry is made. Attention is given to the necessary essentials in producing a high grade milk; the economics of milk production and distribution; food value and uses; the advantages and disadvantages of cooperative milk producers' organizations; the various methods of marketing milk; the transportation, processing and delivery of milk; manufacture and marketing of surplus milk in the form of by-products as cream, cultured buttermilk, chocolate milk, etc.

The laboratory work consists of receiving and making quality tests on milk and the operation of the machinery used in processing market milk.

The buttermaking portion of the course includes studies of milk separation with the selection, care, and use of separators; the pasteurization and ripening of cream; the making and use of starters; a study of churns and churning; modern methods of making butter; tests for moisture, salt, fat, and curd content of butter.

3 class hours and 3 3-hour laboratory periods a week.

Credit, 8.

PROFESSOR HANKINSON, ASSISTANT PROFESSOR LINDQUIST,
and MR. FINNEGAN.

DAIRY S-5. (Judging Dairy Products) I.

This course is a study of the grading and evaluating of dairy product quality based upon product flavor, odor, appearance, and body and texture characteristics. Consideration is given to identification and correction of quality defects. Judging of milk, ice cream, butter, cheese, chocolate milk, buttermilk and sour cream will be emphasized.

1 2-hour laboratory period a week.

Credit, 1.

MR. FINNEGAN.

DAIRY S-6. (General Course for Poultry Majors) II.

This course takes up the importance of dairying in the United States, and especially in the New England States.

Lectures will be given on secretion, composition, and properties of milk, reasons for variation in per cent of butter fat in different samples of milk. The Babcock test for fat in milk, cream, skim milk and buttermilk, the advantages of testing herds, herd improvement associations, advanced registry work; the handling of market milk, soft cheese making, ice cream making, and butter making, as applied to general farm conditions.

The laboratory work consists mainly in testing milk and dairy products for butter fat.

3 class hours and 1 2-hour laboratory period a week.

Credit, 4.

MR. FINNEGAN.

DAIRY S-8. (Grading and Marketing of Dairy Products) II.

This course is arranged for students specializing in Food Management to provide a basis for the more intelligent selection of dairy products.

It includes a consideration of the composition, food value, selection, and use of the different dairy products; a careful study of the methods of marketing and grading; a survey of processing methods and types of packages; and laboratory practice in testing milk products and in evaluating and identifying eating quality of milk, butter, cheese, and ice cream.

During the semester a trip will be made to leading dairy wholesale markets in Boston, at an estimated cost of \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR NELSON, MR. FINNEGAN.



CLASS TRIP TO COMMERCIAL TURKEY FARM

POULTRY HUSBANDRY

PROFESSOR JEFFREY, PROFESSOR SANCTUARY, ASSISTANT PROFESSOR BANTA,
ASSISTANT PROFESSOR VONDELL

There are excellent opportunities in poultry work for men and women who have had the proper training. Graduates from this department have taken their places as leaders in the industry and have filled them capably. Some of them own their own breeding farms, manage or assist in the management of commercial egg farms, while others are in those industries which are closely allied with the production and marketing of poultry products.

Seven specialized courses and one general course are offered by this department. Those students who specialize in poultry culture take all eight courses. The general course is designed to give the students specializing in other branches of agriculture and horticulture the fundamental principles underlying successful poultry raising when a sideline on the farm.

The facilities for practical instruction in poultry husbandry include quarters and equipment in Stockbridge Hall for efficient classroom teaching and demonstrations.

The University Poultry Farm, our practical laboratory, comprises classrooms and laboratories which provide facilities for practice in incubation, breeding, feeding, killing, picking, candling and grading eggs, caponizing, judging, sexing, construction of poultry houses and appliances, and other phases of poultry work.

The well-bred flock of about 1,500 adult birds consists principally of White Plymouth Rocks, Single Comb Rhode Island Reds, Barred Plymouth Rocks, Single Comb White Leghorns and New Hampshires. The largest flocks of approximately 150 birds are used primarily for practical experiments and demonstrations in housing, feeding, breeding and management. Equipment includes several types of lamp and mammoth type incubators; many styles of coal and electric brooders and chick batteries for brooding and rearing approximately 5,000 chicks. A flock of several hundred Jersey Buff Turkeys is maintained.

The practical phases of commercial poultry production are stressed in the courses offered.

Trains For Jobs Like These:

Skilled workers on poultry farms, owner operators and managers; poultry breeding farms; operation of incubators and brooders; wholesale and retail poultry meats; testing, grading and packing eggs; poultry cooperative sales work with eggs, dressed and live fowl; salesmen for poultry feeds and equipment; broiler production and day-old chicks; turkey and duck farms, breeding (record of performance) and disease control (Pullorum) field men.

Field trips will be required during the two years at an estimated cost of \$37 per student. All poultry Stockbridge students will be required to make a trip to the Boston Poultry Show which is held sometime during the month of January. Estimated cost \$6.00.

Poultry Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Animal Husbandry S9 (Special Dairy Cattle course)
Bacteriology S1 (Bacteriology and Rural Hygiene)
Farm Management S3
Poultry Husbandry S1 (Judging and Housing)
Public Speaking S1
Vegetable Growing S9 (General Course)
Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Four Weeks Resident Instruction Followed by Seven Months Placement Training)
Dairy S6 (General Course)
Poultry Husbandry S2 (Incubation and Brooding)
Poultry Husbandry S12 (Specialties)
Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S1 (Farm Economic Problems)
 Agricultural Engineering S3 (Farm Shop)
 Fruit Growing S9 (General Course)
 Poultry Husbandry S5 (Marketing)
 Poultry Husbandry S7 (Breeding)
 Veterinary Science S1 (Animal Sanitary Science)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S2 (Farm Power)
 Agricultural Engineering S8 (Farm Structures)
 Business English S2
 Farm Management S2 (Farm Management and Accounts)
 Poultry Husbandry S4 (Feeding)
 Poultry Husbandry S8 (Supervised Reading and Management)
 Veterinary Science S2 (Applied Animal Sanitary Science)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

POULTRY HUSBANDRY S-1. (Judging and Housing) I.

This course embraces a study of the various economically important types of breeds of domestic fowl, judging for egg production capacity, and for exhibition quality. This course also covers the principles and practices of constructing and equipping houses on a commercial poultry farm. A few trips to nearby poultry plants may be taken to study poultry house ventilation. Two credits for judging; three credits for housing.

3 class hours and 2 2-hour laboratory periods a week.

Credit, 5.

PROFESSOR SANCTUARY AND ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-2. (Incubating and Brooding) II.

A study of incubation and brooding is made by means of the operation of standard incubators and brooders and through a consideration of basic principles. Students select and grade hatching eggs, operate small incubators and observe mammoth incubators for a period of time. Under supervision each student has charge of a brood of chicks.

The incubation part of the course will consist of three class hours, one laboratory period and one practice period, and will run parallel to the brooding part which will consist of two class hours, one laboratory period and one practice hour.

5 class hours; 2 2-hour laboratory periods and the equivalent of 2 2-hour laboratory periods in incubation and brooding practice. (7 days a week.) Credit, 9.

PROFESSOR SANCTUARY.

POULTRY HUSBANDRY S-4. (Feeding) II.

A study of the scientific principles of nutrition essential to commercial success, with particular emphasis on vitamins. Rations properly balanced for various purposes will be calculated. A comparative analysis of the different methods of feeding is included. Textbook: "Feeding Poultry" by Heuser—Published by John Wiley & Sons.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-5. (Marketing) I.

A study of preparing eggs and poultry products to meet the requirements of the northeastern markets. Grades, prices and reports are studied in conjunction with different marketing methods. The laboratories are designed to cover the field of practical grading, internal study, candling and packing of eggs as well as selection, fattening and killing and dressing poultry by the latest approved methods.

A one-half day class trip to Springfield markets in December is required. Estimated cost, \$2.00. Text: Benjamin, Pierce and Termohlen's "Marketing Poultry Products".

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR VONDELL.

POULTRY HUSBANDRY S-7. (Breeding) I.

This course includes the study of the improvement of poultry by means of mass selection, cockerel progeny, flock improvement, and pedigree methods of breeding. Students follow through each step of a pedigree hatch and assist in the selection of the breeders used at the university plant. Basic principles of heredity necessary for an understanding of good breeding practices are studied. A textbook costing \$3.00 to \$4.00 will be required.

4 class hours and 1 2-hour laboratory period a week.

Credit, 5.

PROFESSOR SANCTUARY.

POULTRY HUSBANDRY S-8. (Supervised Reading and Management) II.

Each student will be assigned references in the field in which he is most interested. Oral reports will be required. A major part of the work will be the writing of a term paper and students will be graded on their ability to summarize reference reading and on the neatness of their work. Required day trips totalling three or four days to representative commercial poultry areas are made at an approximate cost of \$30.00 per student. The basic factors essential to a financially successful poultry enterprise are analyzed.

3 class hours a week.

Credit, 3.

•ASSISTANT PROFESSOR BANTA.

POULTRY HUSBANDRY S-9. I.

This course covers candling and grading of eggs, market classification, a study of eggs in the local markets, dressing poultry and various ways of preparing poultry for the table. Prices and market operations form an active part of the course.

A one-half day class trip to the Springfield markets in December is required. Estimated cost, \$2.00.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR VONDELL.

POULTRY HUSBANDRY S-10. (General Poultry Husbandry) II.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation; the production of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the study of breeds and varieties, various types of incubators, brooders, brooder-houses, etc. Textbook: Jull, "Successful Poultry Management." Note: Students who take course S-10 must get permission from the Poultry Department to take advanced poultry courses.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

ASSISTANT PROFESSOR VONDELL.

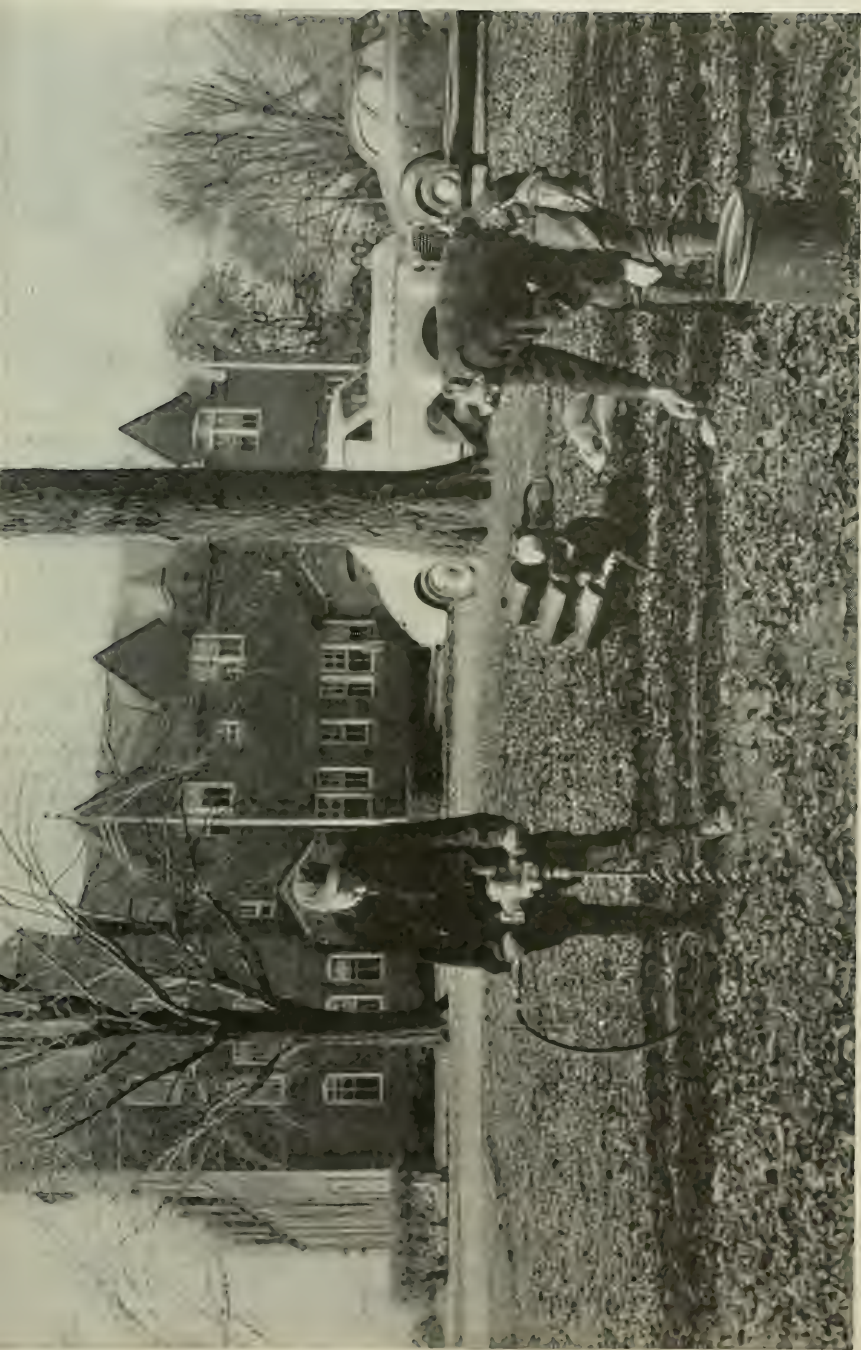
POULTRY HUSBANDRY S-12. (Specialties) II.

Turkeys, ducks, geese, and game birds are considered. Breeding, incubation, feeding, rearing, management, marketing, housing, and disease control methods and practices are studied. Most of the course is devoted to the study of turkeys. Textbook: Jull, "Raising Turkeys," etc.

4 class hours a week.

Credit, 4.

PROFESSOR JEFFREY.



SHEEP FEEDING

ARBORICULTURE

ASSISTANT PROFESSOR KING.

Arboriculture is the care of trees. It includes tree planting; large tree moving; diagnosis and treatment of tree diseases, defects, and mechanical injuries; identification and control of tree insect pests; fertilizing; pruning and repair of storm or otherwise damaged trees; and removal of dead or undesirable trees. A growing appreciation of the value of trees and a demand for a tree maintenance service has led to the development of organizations to supply it. These firms desire trained men. All Massachusetts towns are required to elect tree wardens. The men who accept this responsibility should be trained in the requirements of trees and their care. This course is designed to give this basic training in the care of shade and ornamental trees to supply these needs.

This University offered the first course in the country on shade tree care in 1895, and since then a very high degree of interest in shade trees has been maintained here. Annually in March a school of one week's duration for tree wardens is held on the campus. This school brings together tree wardens and men interested in tree care to discuss their problems. Parts of the program of the school will be of interest to students in this course.

Our large campus has a wide variety of trees of all ages with which the student becomes acquainted, and which also serves as a laboratory for problems similar to those one will have to meet in practice. The research laboratory in shade tree diseases for the state is also located on the campus.

The Massachusetts Arborists' Association and the Massachusetts Tree Wardens and Foresters Association have approved this course as a basic training program.

Due to limited quota of fifteen students in each class and need for careful selection of candidates based on physical qualifications and business objectives, as well as adequate scholastic preparation, a personal interview is required of all applicants before final acceptance can be given.

Those electing Arboriculture must register two weeks prior to the opening of the fall semester for the preliminary training period. Applicants will be notified of the date of registration. This two-week period before the start of regular class work will be used for intensive training in the use of ropes, climbing, and the use of knots and safety practices. Eight hours a day will be given over completely to this purpose. Only those who qualify in this preliminary program will be permitted to take the course in Arboriculture. Those who do not qualify may take the Ornamental Horticulture course. All students applying for the course must have a doctor's certification that they are physically fit. Any heart ailment or other serious weakness automatically disqualifies an applicant.

Senior Field Trips: Seniors will make an annual three-day field trip late in October. There will also be three one-day trips to attend shade tree conferences in Connecticut and Massachusetts. One trip will be made to the Bussey Institute to study plant breeding techniques and demonstrations.

Freshman Field Trips: Three trips to survey field work in the various phases of arboriculture in the state. Two trips to attend shade tree conferences. One trip to study the tree types at the Arnold Arboretum.

Arboriculture

First Year

First Semester

(Eighteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Agronomy S5 (Construction and Maintenance of Fine Turf Areas)
 Arboriculture S0 (Tree Climbing. Special Qualifying Course)
 Arboriculture S1 (Practices and Policies)
 Botany S1 (Tree Physiology)
 Horticulture S1 (Plant Materials, Trees)
 Public Speaking S1
 Physical Education S1 (Required of men students not participating in football)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Arboriculture S2 (Continuation of S1)
 Botany S2 (Diseases of Trees and Shrubs)
 Entomology S2 (Insects of Ornamental Trees and Shrubs)
 Horticulture S2 (Plant Propagation)
 Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Arboriculture S3 (Diagnosis and Control)
 Arboriculture S5 (Shade Tree and Shrub Pests)
 Arboriculture S7 (Shade Tree Surveys and Cost Estimates)
 Business English S1
 Forestry S3 (Woodland Management)
 Horticulture S3 (Surveying and Mapping)
 Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Arboriculture S4 (Diagnosis and Control)
 Arboriculture S6 (Shade Tree and Shrub Pests)
 Arboriculture S8 (Shade Tree Surveys and Cost Estimates)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Horticulture S4 (Landscape Construction Problems)
 Horticulture S6 (Plant Materials, Shrubs)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

ARBORICULTURE S-0. (Tree Climbing) I.

For two weeks previous to the regular opening of school, all students electing this major will attend a special qualifying course in tree climbing. This course will be conducted on the campus for eight hours each day for two weeks to acquaint the student with ropes, tools, and climbing techniques. To be enrolled in the arboriculture major all students must pass this qualifying tree climbing practice.

ASSISTANT PROFESSOR KING.

ARBORICULTURE S-1. (Practices and Policies) I.

Factual material covering the phases or types of work; pruning, cabling, bracing, fertilization and line clearance. Laboratory work in the application of class discussion.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR KING.

ARBORICULTURE S-2. (Continuation of S-1) II.

Soils, their origin, structure and function as pertaining to tree growth and development. Fertilizers, their use, sources, application and functions of their elements in the growth and development of a tree. Cuts and fills and their treatment and simple cavity treatments.

Tree planting and maintenance programs following the closing of the regular eight week session. One week of training in tree moving, fertilization, and cabling. During this week of training the students will spend all their time in the field. There will be no scheduled classes in any other courses.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR KING.

ARBORICULTURE S-3 and S-4. (Diagnosis and Control) I. II.

Individual and class assignments in the diagnosis of infectious and non-infectious diseases and the proper treatments and corrective measures. Analysis of symptoms and effects common to diseases and environmental influences. Methods and techniques used to determine the causes and their treatments.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR KING.

ARBORICULTURE S-5 and S-6. (Shade Tree and Shrub Pests) I. II.

Recognition of the prevalent shade tree and shrub insects and diseases, their life cycles, control measures, equipment and materials used in control. The lectures and laboratory work in diseases and insects will run concurrently throughout the two semesters of the senior year. Insect and fungus collection of specimens required.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR KING.

ARBORICULTURE S-7 and S-8. (Shade Tree Surveys and Cost Estimates) I. II.

The use and determination of shade tree surveys. Time and cost estimates and shade tree maintenance programs as determined by shade tree surveys. City planting and planning programs essential for city and street tree care and development. Advanced work in cavity treatments, bracing and cabling.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR KING.

Trains for Jobs Like These:

Operators, foremen and salesmen for arboriculture firms, utility line clearance foremen, deputy tree wardens and eventually tree wardens in towns and cities, tree care in estates, parks, state highways, college campuses or grounds of other public institutions, developing one's own service organization for the practice of arboriculture.

Recommended clothes for tree climbing: breeches, good heavy workshirts.

All students qualifying will be required to obtain personal tools for cavity work, a hand saw, and a pair of 14" or 16" high top shoes with rubber or composition soles and heels at an approximate cost of \$50.00. These can be obtained through the University Bookstore.

In each of the Arboriculture courses S1, S2, S3, S4, S5, S6, S7, and S8, required trips will be made to commercial operations in various parts of the state, the travel cost to be borne by the student, not to exceed \$10 per semester, or a total of \$40.

COMMERCIAL VEGETABLE GROWING

PROFESSOR SNYDER, ASSISTANT PROFESSOR TUTTLE, MR. JOHNSON

There are many opportunities for both men and women who complete the Stockbridge School vegetable growing courses. These include the operation of a market garden, truck crop, or greenhouse business; skilled employees of commercial operators; operators or trained employees in the many types of wholesale and retail marketing; employees in responsible positions on private estates, private and state institutions as well as with commercial companies handling agricultural products such as fertilizers, seed and various supplies and equipment.

The production and marketing of vegetable crops is a highly specialized business involving a background of technical training as well as a knowledge of practical skills. The staff and facilities of the Department of Vegetable Growing are well qualified and adequate to give a thorough training to students in the fundamentals essential to growing, harvesting and marketing the many vegetable crops commonly grown in New England.

In addition to the facilities of the Department, trips will be made to several production areas and markets to observe actual operations.

Trains For Jobs Like These:

Skilled workers on market garden and truck farms, growers of commercial vegetable crops in greenhouses, cold frames, and fields. Operating all types of farm machinery, tractors, cultivators, seeders, both motor and horse-drawn; preparing crops for market, sorting, grading, bunching, packing. Wholesale and retail sales and distribution. Workers for seed-growing firms, plant breeding and field work on testing plots. Operators, owners, managers of vegetable crop farms. State and federal market inspectors on commercial grades and packs. Buyers and inspectors for dehydration and quick freezer plants. Institutional farm managers.

Field trips will be required during the two years at an estimated cost of \$40 per student.

Commercial Vegetable Growing

First Year.

First Semester

(Sixteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Floriculture S3 (Greenhouse Management)
 Fruit Growing S1 (Growing Tree Fruits)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Vegetable Growing S3 (Systematic Vegetable Growing)
 Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Floriculture S2 (Greenhouse Construction and Heating)
 Fruit Growing S2 (Orchard and Vineyard Pruning)
 Poultry Husbandry S10 (General Course)
 Public Speaking S2
 Vegetable Growing S2 (Principles of Vegetable Culture)
 Vegetable Growing S12 (Diseases, Insects, and Their Control)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Power)
 Agricultural Engineering S9 (Drainage and Farm Structures)
 Beekeeping S1 (Fall Management, Wintering, Honey, and Bee Diseases)
 Business English S1
 Fruit Growing S7 (Small Fruits)
 Vegetable Growing S5 (Market Practices)
 Vegetable Growing S7 (Commercial Vegetable Growing)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Beekeeping S2 (Spring Management, Pollination and Honey Production)
 Farm Management S2 (Farm Management and Accounts)
 Food Technology S2 (Basic Principles, Freezing, Canning and Pickling)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Vegetable Growing S4 (Vegetable Forcing)
 Vegetable Growing S6 (Marketing Methods)
 Vegetable Growing S8 (Commercial Vegetable Growing)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

VEGETABLE GROWING S-1. (Principles of Vegetable Culture) I.

Lecture periods are devoted to discussions covering certain fundamental principles of plant structure and growth as they influence and regulate commercial vegetable culture. The work in the laboratory includes detailed studies in seedage, plant growing, manures and fertilizers, garden planting, pests, storage and marketing.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-2. (Principles of Vegetable Culture) II.

Lectures are devoted to discussions of the more important environmental factors of the soil and climate which regulate plant growth and reproduction, including water, temperature, light, humidity and wind.

3 class hours a week.

Credit, 3.

MR. JOHNSON.

VEGETABLE GROWING S-3. (Systematic Vegetable Growing) I.

This course is designed to acquaint the student with the identification, nomenclature and classification of the standard types and varieties of vegetables; judging and exhibiting; seed production and variety improvement work.

1 class hour 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-4. (Vegetable Forcing) II.

A study of the principles and practices involved in growing, harvesting and marketing of vegetable crops commonly grown in forcing structures, especially tomatoes, cucumbers, lettuce, mushrooms and rhubarb. Discussions will also include the growing and handling of vegetable plants for field setting, in plant houses, hotbeds and cold frames.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-5. (Marketing Practices) I.

A study of the various factors and practices involved in harvesting, preparing for market (bunching, tying, wrapping, waxing), grading, packaging, packages used, brands and inspection of vegetables for various market outlets as well as packing house facilities and storage. Trips to nearby and Boston markets will cost approximately \$10.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR SNYDER.

VEGETABLE GROWING S-6. (Marketing Methods) II.

A continuation of the studies in S-5 covering the marketing of vegetables with emphasis on advertising, salesmanship, roadside markets, wholesale and retail outlets, market reports and transportation by truck, rail and plane.

3 class hours a week.

Credit, 3.

PROFESSOR SNYDER.

VEGETABLE GROWING S-7. (Commercial Vegetable Culture) I.

Problems and practices of the commercial grower are discussed as they involve seedage, planting, cultivation, irrigation, tools, machinery, farm organization, and management.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JOHNSON.

VEGETABLE GROWING S-8. (Commercial Vegetable Culture) II.

This is a continuation of Vegetable Growing S-7 in which the discussions involve the cultural practices for the various vegetables that are of commercial importance in the New England area. Organized trips to market gardening areas are required which cover a period of approximately three days and cost about \$30.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR TUTTLE.

VEGETABLE GROWING S-9. (General Course) I.

This course is designed to meet the needs of students in other majors who cannot devote more than one semester to a study of vegetable growing. Attention is to be given to starting plants early, transplanting, seeding, fertilizing, spraying, dusting, harvesting, marketing, and storing the more important vegetable crops.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JOHNSON.

VEGETABLE GROWING S-12. (Diseases, Insects and Their Control) II.

This course is intended to give those students majoring in vegetable growing an understanding of the more common insects and diseases which attack vegetable plants and the most satisfactory methods for controlling these pests.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

ASSISTANT PROFESSOR TUTTLE.

FLORICULTURE

PROFESSOR THAYER, ASSISTANT PROFESSOR HUBBARD,
ASSISTANT PROFESSOR ROSS, MR. DUNHAM

Students who complete the major in Floriculture are fitted primarily for work in commercial and private estate greenhouse establishments and retail flower stores. After gaining experience such students may be able to start in business for themselves. With the courses in Ornamental Horticulture they should be qualified for positions on private estates, in parks, or in nurseries.

The offices and classrooms of the Department are located in French Hall. Of the two lecture rooms, one will accommodate 80 students, the other 30 students; a laboratory, equipped with slate-covered tables, will accommodate 40 students; the greenhouse laboratory for 20 students provides excellent facilities for much of the practical work. In the basement of the building there are located a specially prepared room for bulb storage, a fertilizer and tool room, and space for general storage purposes.

The glass area of the Department consists of approximately 14,000 square feet divided as follows: (1) the French Hall range of 11,800 square feet, a modern, practical, commercial range including propagating, palm and fern, chrysanthemum, carnation, rose and student houses; (2) approximately 2,200 square feet in cold frames and hotbeds. In addition, the Department has the use of the materials in the Durfee Plant Houses, an old range of 7,400 square feet, which houses primarily a collection of tropical, decorative, and other conservatory plants.

Land is available for the outdoor culture of florists' crops. A small perennial garden and a small rose garden are maintained.

Trains For Jobs Like These:

Skilled workers in commercial greenhouses and on private estates, growing all types of flower crops; wholesale and retail florists, growers, salesmen, managers; flower arrangement work, designers and decorators in retail flower stores; salesmen for florists' supplies and equipment.

Students who major in Floriculture are required to purchase in the first semester of the first year, Taylor's Garden Dictionary, estimated at \$5.00.

Field trips will be required during the two years at an estimated cost of \$20.00.

Floriculture

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Floriculture S1 (Garden Materials)
Floriculture S3 (Greenhouse Management)
Horticulture S1 (Plant Materials)
Public Speaking S1
Vegetable Growing S1 (Principles of Vegetable Culture)
Physical Education S1 is required of men students not participating in football; also required of women students)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
Agronomy S2 (Fertilizers)
Botany S2 (Diseases of Trees and Shrubs)
Entomology S2 (Insect Pests of Ornamental Trees, Shrubs, and Flowers)
Floriculture S2 (Greenhouse Construction and Heating)
Horticulture S2 (Plant Propagation)
Public Speaking S2
Vegetable Growing S2 (Principles of Vegetable Culture)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S3 (Farm Shop)
 Business Management S1 (Fundamentals of
 Business Management)
 Floriculture S5 (Commercial Production)
 Floriculture S7 (Flower Arrangement)
 Fruit Growing S7 (Small Fruits)
 Horticulture S7 (Grounds Maintenance)
 Physical Education S5 (Required of men stu-
 dents not participating in football; also re-
 quired of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Business English S2
 Floriculture S6 (Commercial Production)
 Floriculture S8 (The Uses of Herbaceous Plants)
 Floriculture S10 (Conservatory Plants)
 Horticulture S6 (Plant Materials)
 Vegetable Growing S4 (Vegetable Forcing)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

FLORICULTURE S-1. (Garden Materials) I.

A study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture and uses are considered. Laboratory exercises include work in propagation, planting, identification of materials, and planning of beds and borders.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. DUNHAM.

FLORICULTURE S-2. (Greenhouse Construction and Heating) II.

The origin, growth, and importance of the floricultural industry; types of greenhouses, types of construction, painting, glazing, ventilators, beds and benches, and methods of heating. Trips may be taken to visit greenhouse ranges in the vicinity of Amherst with university transportation.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR THAYER and
 ASSISTANT PROFESSOR ROSS.

FLORICULTURE S-3. (Greenhouse Management) I.

A study of the principles of greenhouse management including the consideration of soils, fertilizers, watering, ventilation, temperature regulation, insect and disease control.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSORS HUBBARD AND ROSS.

FLORICULTURE S-5. (Commercial Production) I.

Courses S-5 and S-6 are devoted to a consideration of the important commercial crops. Special attention is given to the culture (under glass) of carnations, roses, chrysanthemums, sweet peas and snapdragons. Other cutflower crops and seasonal pot plants are also considered. Modern methods of production including soilless culture and subirrigation practices are discussed in detail.

All members of the class may be required to take a one-day trip to visit a large commercial greenhouse range at an approximate cost of \$10.00 each.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR HUBBARD.

FLORICULTURE S-6. (Commercial Production) II.

A continuation of Floriculture S-5.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR HUBBARD.

FLORICULTURE S-7. (Flower Arrangement) I.

The lectures include a discussion of the principles and techniques underlying the use of flowers in corsages, wedding bouquets, vase, bowl, and basket arrangements, table decorations, funeral designs and sprays, and decorations for public functions. The study of color and color harmonies is also considered in this course. The laboratory periods provide opportunity for actual practice in making the various types of arrangements which are considered in the classroom.

Students enrolled in this course are required to take a one day trip to attend the United Florists' Trade Fair and School in Boston.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR ROSS.

FLORICULTURE S-8. (The Uses of Herbaceous Plants) II.

This course is a continuation of Floriculture S-1 and is intended for students majoring in Floriculture and Ornamental Horticulture. It provides opportunity for a more detailed study of many of the plants considered in the preceding course with special emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens.

Students enrolled in this course take a one-half day trip to attend the Western Massachusetts Flower Show in Springfield.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

ASSISTANT PROFESSOR HUBBARD and MR. DUNHAM.

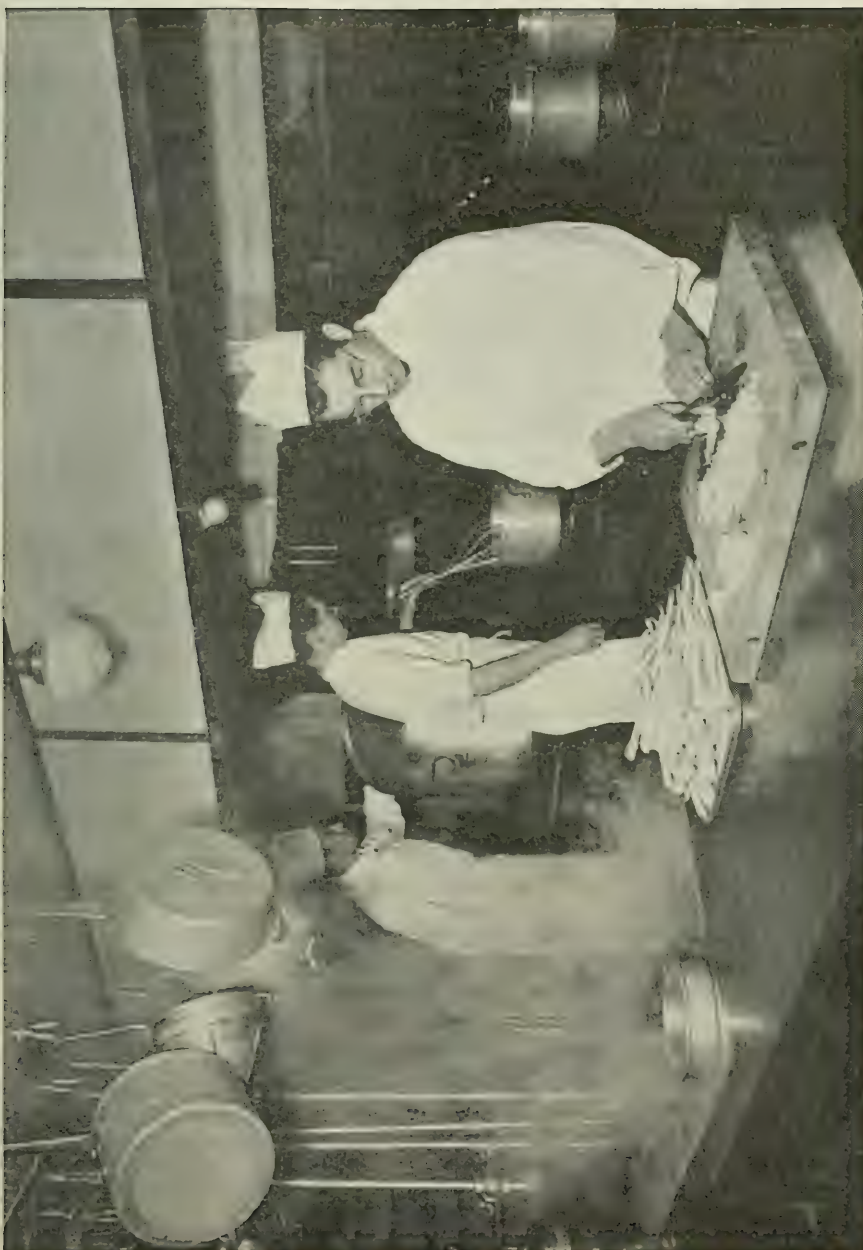
FLORICULTURE S-10. (Conservatory Plants) II.

A study of the plants, both foliage and flowering, used in conservatories and in decorative work or sold in the retail flower shop. Methods of propagation, culture, uses and identification of plants are included in the course. Trips may be taken to visit the conservatories at Smith and Mount Holyoke Colleges with university transportation.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR THAYER and MR. DUNHAM.



A LABORATORY EXERCISE IN FOOD MANAGEMENT—UNIVERSITY CAFETERIA

FOOD MANAGEMENT

PROFESSOR FELLERS, ASSOCIATE PROFESSOR LEVINE, ASSISTANT PROFESSOR
KRANZ, MR. NEBESKY

Food management work in all its various trade sub-divisions is closely allied to food production work. Purchasing agents for wholesale and retail food chains must know vegetables and fruits of all kinds, meats, and dairy products such as milk, butter, cheese and ice cream; poultry products such as fowl, ducks, turkeys, and all kinds of eggs and egg products. This same knowledge of superior grades, varieties, and packs of all agricultural products, as well as the modern methods of cooling, freezing, preserving, processing, and serving, is highly essential to the hotel and restaurant industry for its supply of future managers, stewards, and operators. Lunchroom, tearoom, and all summer resort operators should have thorough training in the procurement of food supplies of superior quality if trade competition and public demands are to be efficiently and economically controlled.

Modern methods of food processing including canning, freezing, dehydration and packaging, place a greater responsibility on institutional buyers. Sound knowledge in food production methods may be considered essential to the complete training of stewards, food managers, and restaurant operators. Railroad and aviation dining service offer large new fields for food management efficiency and service.

Planning of menus and preparation of food is studied and practiced in this course, along with a complete survey of the whole food production program in agriculture. The excellent equipment of the farms, orchards, food, technology laboratories and dining halls, is a major factor for thorough training which this University provides.

This course is sponsored by the Massachusetts Hotel Association and by the Massachusetts Restaurant Association whose members are cooperating in the placement and employment of students and graduates. The Boston Stewards Club has generously donated an annual scholarship prize fund and the state hotel association has established a loan fund for student aid.

The Food Management course is given with the cooperation of the University dining halls under the management of Mr. Walter O. Johnson.

Due to limited quota of twelve students in each class and need for careful selection of candidates based on scholastic preparation, business objectives, and experience factors determining choice of course, a personal interview is required of all applicants before final acceptance can be given.

Trains For Jobs Like These:

Assistant cooks, cooks, stewards, in restaurants, cafeterias, hotels, country inns and vacation resorts serving both summer and winter clientele. All New England states have a huge business in their country areas providing home-grown foods and food products for the year-round vacation trade. Many farm homes and boarding houses rely on this type of business for a considerable part of their income. New England foods from shore and farm have earned a distinctive quality which this course seeks to maintain.

For butchering and dressing all kinds of livestock, and preparation of commercial meat cuts and products. For quick freezing all types of farm products for commercial sale or for freezer locker plants, their operation and maintenance. For work in canning and preserving plants.

Field trips will be required during the two years at an estimated cost of \$52.00 per student.

Food Management**First Year****First Semester**

(Sixteen Weeks Resident Instruction)
 Foods and Nutrition S1 (Basic Principles of Food Preparation)
 General Mathematics S1
 Introduction to Stewarding S1
 Kitchen Administration S1
 Menu Planning S1
 Poultry Husbandry S9
 Practical Science S7
 Public Speaking S1
 Vegetable Growing S5 (Marketing Practice)
 Quantity Foods S1
 Wines S1
 Physical Education S1 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction followed by four months Placement Training)
 Agricultural Engineering S12 (Food Handling Equipment)
 Foods and Nutrition S2 (Meal Preparation and Service)
 Food Technology S2 (Basic Principles, Freezing, and Canning)
 Hotel Accounts S2
 Practical Science S8
 Public Speaking S2
 Quantity Foods S2
 Special Lectures S2
 Wines S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Bacteriology S3 (Food Sanitation)
 Entomology S3 (Structural Pests)
 Foods and Nutrition S3 (Elementary Nutrition)
 Food Technology S5 (Food Manufacturing)
 Fruit Growing S11 (Fruits and Fruit Handling)
 Kitchen Administration S3
 Quantity Foods S3 (Preparation and Serving Dinner)
 Storekeeping S1
 Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S4 (Marketing)
 Animal Husbandry S8 (Food Management Meats)
 Business English S2
 Dairy S8 (Grading and Marketing of Dairy Products)
 Food Service S2
 Hotel Accounts S2
 Menu Planning S2
 Special Lectures S4

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

AGRICULTURAL ECONOMICS S-4. (Marketing) II.

This course is designed to give instruction in purchasing and in management for Hotel Stewards. A study of the distribution system for food products will be given as well as merchandising practices, store location, advertising and personnel management.

2 class hours a week.

Credit, 2.

PROFESSOR LINDSEY.

AGRICULTURAL ENGINEERING S-12. (Food Handling Equipment) II.

A study of the principles of operation, the care and maintenance of kitchen and other equipment used in food preparation for large groups. Refrigeration, heating and cooking, cleaning, and lighting equipment, as well as pumps and electrical appliances are covered in exercises which give incidental practice in soldering, pipe fitting, and the selection of proper wire size.

Through the cooperation of commercial agencies, a one-day period of special instruction on industrial kitchen equipment and commercial lighting applications is provided.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR PFLUG.

ANIMAL HUSBANDRY S-8. (Meats Course) II.

For Seniors in the Food Management Course. This course is designed to impart a knowledge of the fundamental principles involved in judging, purchasing, and efficiently utilizing meat and meat products. Laboratories will involve actual slaughtering, dressing, wholesale and retail cutting, and preparation of by-products. Judging practice will be secured in a near by packer cooler and at the end of the course a one day trip costing \$10.00 will be scheduled

to several large packing houses in Boston. Textbook: Ziegler, "The Meat We Eat." Special equipment needed for this course includes knives, boots, and wash suits,—estimated cost \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR HALE.

BACTERIOLOGY S-3. (Food Sanitation) I.

This course includes a general study of micro-organisms responsible for the common diseases of man and the methods employed in their detection and control. It introduces the student to the application of bacteriological principles in the analysis of water, milk and milk products, and other food substances. Bacteria, molds, and yeasts are studied as living agents responsible for the decay, spoilage and infection of foods. The importance of the proper control of these living agents in the production and ripening of certain foods is considered. The conditions necessary for microbial growth and factors responsible for the universal distribution of micro-organisms are studied. The application of sanitation, chemical preservatives and physical and environmental conditions in the control of food infection or spoilage is discussed and demonstrated.

This course is designed to give students interested in the practical problems of food sanitation, spoilage, handling, and preservation a better understanding of bacteria and an appreciation of their importance in the sanitary production and handling of foods.

2 class hours and 1 3-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR PERRIELLO.

DAIRY S-8. (Grading and Marketing of Dairy Products) II.

This course is arranged for students specializing in Food Management to provide a basis for the more intelligent selection of dairy products.

It includes a consideration of the composition, food value, selection, and use of the different dairy products; a careful study of the methods of marketing and grading; a survey of processing methods and types of packages; and laboratory practice in testing milk products and in evaluating and identifying eating quality of milk, butter, cheese, and ice cream.

During the semester a trip will be made to leading dairy wholesale markets in Boston, at an estimated cost of \$15.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR NELSON.

MR. FINNEGAN.

ENTOMOLOGY S-3. (Structural Pests) I.

This course is offered during the last eight weeks of the first semester. General introduction to Entomology, followed by studies and discussions of more important pests with which hotel stewards would come in contact.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR SWEETMAN.

FOODS AND NUTRITION S-1. (Basic Principles of Food Preparation) I.

This course aims to teach the basic scientific principles of food preparation. It will include standards for finished products, conservation of nutritive values, foundation recipes, food materials, actual preparation of typical foods and recent developments in food preparation.

2 class hours and 2 3-hour laboratory periods a week.

Credit, 4.

MISS DAVIS.

FOODS AND NUTRITION S-2. (Meal Preparation and Service) II.

This course is a further study of nutritive value and preparation of food with emphasis on planning, preparation of meals and meal service. Some emphasis is placed upon the organization and executing of chefs' and stewards' duties as they exist in restaurant and hotel set-ups. All food preparation is limited to small quantities. Types of menus will be prepared.

1 class hour and 1 3-hour laboratory period a week.

Credit, 2.

MISS DAVIS.

FOODS AND NUTRITION S-3. (Elementary Nutrition) I.

This course is designed to give a general survey of the fundamental principles on which the normal person may plan an adequate dietary. It includes a study of the nutritive value of foods so as to make wise selection possible.

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR COOK.

FOOD SERVICE S-2. II.

Kitchen and restaurant equipment, quantity and formula cooking, steward employee relationship, steward-purveyor relationship. Psychology applied to personnel management, conferences, work supervision, advancement, opportunities. Responsibilities of a steward; health and safety sanitation; labor and food laws.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR KRANZ.

FOOD TECHNOLOGY S-2. (Basic Principles, Freezing, Canning and Pickling) II.

Principles of food preservation including refrigeration and modern locker storage management are covered. Work is given in the use of packaging materials and the examination and grading of food products. Three field trips will be required. Estimated cost \$10.00. This is a full semester course for Food Management majors.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

MR. NEBESKY.

FOOD TECHNOLOGY S-5. (Food Manufacturing) I.

Class work consists of study and laboratory exercises on phases of the food industry of major interest to the students. The studies include food preservation methods, manufacture of carbonated beverages, pickled products, confectionery production and commercial bakery procedures and operations. Some field trips to local commercial food plants will be made.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSOCIATE PROFESSOR LEVINE.

FRUIT GROWING S-11. (Fruits and Fruit Handling) I.

This course is designed primarily for students who are specializing in Food Management. It includes:

1. A study of common varieties of native fruits, citrus fruits, and bananas and the season during which each variety is at its best from the standpoint of the consumer.

2. A consideration of the factors which determine grades of various fruits.

3. A thorough study of storage qualities and methods of storing all fruits commonly used here.

A two-day field trip is a part of the course. Estimated cost, \$10.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

GENERAL MATHEMATICS S-1. I.

This course provides a thorough drill in those fundamentals which are used in practical arithmetic. Fractions, ratio and proportion, percentage, formulas of area and volume, graphs, logarithms, and the use of the slide rule will be studied.

2 class hours a week.

Credit, 2.

HOTEL ACCOUNTS S-2. II.

This course is a continuation of Storekeeping S1 with emphasis on bookkeeping. This will include study of the uniform system of accounts as recommended by the American Hotel Association; food costs and dining room and restaurant accounts.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

INTRODUCTION TO STEWARDING S-1. I.

This course includes the following: Kitchen personnel; list of occupational divisions; duties of individuals; receiving, delivery, and shipping departments; food purchasing; markets; bookkeeping and budgeting; cleanliness and sanitation; duties of storekeeper and assistant steward.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

KITCHEN ADMINISTRATION S-1 and S-3. I.

The course will be a general study of the various problems arising in the operation of a commercial kitchen. Attention will be given to the planning and equipment of kitchens, food control and costs, and personnel problems. Beverages and their service; planning meals and menus. Field trips are made to near-by kitchens.

S-1 — 1 4-hour laboratory period a week.

S-3 — 2 class hours a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

MENU PLANNING S-1 and S-2. I. II.

1 class hour a week.

Credit, 1.

ASSISTANT PROFESSOR KRANZ.

POULTRY HUSBANDRY S-9. I.

This course covers candling and grading of eggs, market classification, a study of eggs in the local markets, dressing poultry and various ways of preparing poultry for the table. Prices and market operations form an active part of the course.

A one-half day class trip to the Springfield markets in December is required. Estimated cost, \$2.00.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR VONDELL.

PRACTICAL SCIENCE S-7 and S-8. I. II.

This is a course in applied sciences, chiefly in the fields of chemistry and physics, as they are tools serving the needs of the dairy and food industries. In general, the course is designed to give an introduction to scientific thought and phenomena by means of lectures, textbook study and classroom demonstrations. The emphasis is entirely built around the practical problems in the student's

field of work. Practical Science S8 is a full semester course for Food Management majors.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR EVERSON.

QUANTITY FOODS S-1, S-2, and S-3. (Preparation and Service) I. II.

This course is planned to give the student an insight into the problems of the kitchen department of the hotel, restaurant or club. Students will be under the supervision of the manager of the Dining Hall and will be apprenticed to the regular employees at the University Dining Hall and will assist the cooks, baker, stock clerk, etc., during the laboratory periods. The course is planned so that each student will have the opportunity to do actual work in quantity food preparation and service.

1 4-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

SPECIAL LECTURES S-2 and S-4. II.

Registration restricted to Food Management students. These lectures will be presented weekly by men within the hotel and restaurant industry and allied professions and by members of the university faculty. They will cover a variety of subjects all of which will be of interest and value to young people planning to enter the hotel and restaurant business.

1 class hour a week.

Credit, 1.

THE DEPARTMENT.

STOREKEEPING S-1. I.

This course aims to give the student an elementary working knowledge underlying the record system for keeping stocks and inventories. This includes receiving and disbursing stocks and records; also, perpetual inventories and food store management; refrigerator and dry storages.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR KRANZ.

VEGETABLE GROWING S-5. (Marketing Practice) I.

A study of the various factors concerned with the harvesting and marketing of vegetable produce, including grades, packs, packages, brands, market and inspection requirements.

3 class hours a week.

Credit, 3.

PROFESSOR SNYDER.

WINES S-1 and S-2. I. II.

S1 1 class hour a week.

Credit, 1.

S2 1 2-hour laboratory period a week.

Credit, 1.

ASSISTANT PROFESSOR KRANZ.

About 129,000 citizens of Massachusetts are engaged directly in agricultural pursuits while a slightly larger number are engaged in "allied industries" which aid the farming industry by obtaining farm supplies and services for production, and then provide the services and facilities for marketing the farm products. This means approximately 100,000 jobs. From 3,000 to 5,000 replacements are required every year to maintain the industry.

APPLIED FORESTRY

PROFESSOR HOLDSWORTH, PROFESSOR TRIPPENSEE, PROFESSOR RHODES, ASSOCIATE PROFESSOR RICH, ASSISTANT PROFESSOR STICKEL, MR. MACCONNELL, MR. COLE

The two year course in applied forestry is intended to equip men with a sound understanding of the basic principles of forestry and their vocational application in the field.

The men who elect to take the course should fully understand that the vocation for which they are preparing will involve hard work, much of it physical in character. They should also keep in mind that a man trained in forestry techniques will be in a position to advance through apprenticeship to jobs of genuine responsibility.

There is a definite place in the broad field of forestry for trained workers who are capable of understanding and intelligently carrying out the tasks of a sub-professional character which are so necessary to forest maintenance and development.

Prospective students should have clearly in mind a very definite idea of the occupation they intend to follow upon completion of the course of study described here. Each student should have his own well defined employment goal.

Due to limited quota of fifteen students in each class and a slightly higher requirement in basic mathematics and science preparation, a personal interview is necessary before final acceptance can be given.

Men who successfully complete the curriculum in applied forestry are qualified for places with timber growing and forest products industries, for supervision of forested estates, watershed properties, town forests and for work with certain public agencies which are concerned with forestry.

Facilities: The University owns 800 acres of woodland which is used for the laboratory and field studies of the Stockbridge School. It has ready access to a very considerable additional acreage in the neighborhood of Amherst.

Placement Training: The program of study and training requires the students of Applied Forestry to spend four months in placement training. The placement jobs in forestry often require the student to work at a considerable distance from this region.

Equipment: The Forestry Department has good technical equipment for field study purposes.

Student Limitation: Each entering class is limited to fifteen men.

Student Needs: In addition to the regular expense of the Stockbridge School, the student must be prepared to buy draughting equipment costing about \$30.00, a hand compass costing about \$7.00, and should be able to take several field trips, the cost of which will be about \$50.00.

APPLIED FORESTRY

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Forestry S1 (Dendrology)
Forestry S5 (Forest Measurement)
Forestry S7 (Forest Physiology)
Review Mathematics S3
Physical Education S1

Second Semester

(Sixteen Weeks Resident Instruction Followed by
Four Months Placement Training)
Business English S2
Forestry S2 (Wood Identification)
Forestry S4 (Forest Draughtsmanship)
Forestry S6 (Forest Measurement)
Forestry S8 (History of American Forestry;
Forest Economics)

Electives

Physical Education S4 (Basketball and Hockey)
Physical Education S6 (Baseball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
 Forestry S11 (Silvics)
 Forestry S13 (Harvesting)
 Forestry S15 (Forest Protection)
 Forestry S17 (Library Reading and Reports)
 Horticulture S3
 Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
 Forestry S10 (Forest Management)
 Forestry S12 (Applied Silviculture)
 Forestry S14 (Forest Products)
 Forestry S16 (Seeding and Planting)
 Forestry S18 (Wildlife Management)
 Forestry S20 (Forest Insects and Diseases)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

FORRESTRY S-1. (Dendrology) I.

Features of identification, classification and geographical distribution of the principal trees of North America together with a study of the vegetation regions of the United States and Canada.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

FORESTRY S-2 (Wood Identification) II.

The gross structural and identification features of our most used North American woods. Laboratory practice in wood identification using macroscopic features.

2 2-hour laboratory periods a week.

Credit, 2.

FORESTRY S-4. (Forest Draughtsmanship) II.

A course designed to teach the use of draughting equipment for purposes of map, chart and graph making. Instruction in lettering is included.

2 2-hour laboratory periods a week.

Credit, 2.

FORESTRY S-5. (Forest Measurement) I.

Determination of the volume and value of forest growing stock by several approved methods. This involves the making of a chain and compass area survey, type mapping and the use of instruments used in forest estimating and growth studies.

2 class hours and 1 4-hour laboratory period a week.

Credit, 4.

FORESTRY S-6. (Forest Measurement) II.

Continuation of and development of S-1.

3 class hours a week (or equivalent field work)

Credit, 3.

FORESTRY S-7. (Forest Physiology) I.

The structure and physiological functions of forest trees and other forest vegetation. A classroom course with demonstrations.

3 class hours a week.

Credit, 3.

FORESTRY S-8. (History of American Forestry; Forest Economics) II.

The story of the development of forestry in the United States; The Economics of Forestry.

2 class hours and 1 seminar hour a week.

Credit, 3.

FORESTRY S-10. (Forest Management) II.

The management of American forests; the preparation of operational management plans. Class and field work.

2 class hours and 1 4-hour field period a week.

Credit, 4.

FORESTRY S-11. (Silvics) I.

The forest qualities and requirements of forest trees, including a study of tree-growing site relationships, growth rates, tolerance, temperature, and moisture factors. Special emphasis is laid on the experience of others in the forest use of certain tree species.

3 class hours a week.

Credit, 3.

FORESTRY S-12. (Applied Silviculture) II.

This course considers the several forest reproduction methods, the intermediate cuttings, together with extensive field practice in their application.

1 8-hour field period a week.

Credit, 4.

FORESTRY S-13. (Harvesting) I.

The methods of harvesting forest products with special emphasis on means used in New England. A general survey of methods used in all of the forest regions of the United States.

2 class hours and 1 4-hour laboratory field period a week.

Credit, 3.

FORESTRY S-14. (Forest Products) II.

The properties of American woods. The products of the forest industries.

3 class hours a week.

Credit, 3.

FORESTRY S-15. (Forest Protection) I.

Methods of protecting the forest against fire and other forest-destructive agencies.

3 class hours a week. Field trips by arrangement.

Credit, 3.

FORESTRY S-16. (Seeding and Planting) II.

This course considers the production of forest planting stock in nursery; the characteristics and quality of forest tree seed; artificial reforestation.

1 class hour and 2 2-hour field and laboratory periods a week.

Credit, 3.

FORESTRY S-17. (Library Reading and Reports) I.

Library reading and study on assigned forestry subjects. Designed to develop the ability to analyze forestry material and to abstract it clearly and concisely.

2 hours general seminar. Individual Conferences.

Credit, 3.

FORESTRY S-18. (Wildlife Management) II.

Effects of animals on the forest; and the effects of forest practices on wild animal production.

3 class hours a week.

Credit, 3.

FORESTRY S-20. (Forest Insects and Diseases) II.

A study of the characteristics of the principal forest insects and diseases and the nature of the damage they inflict or the good that they do in the forest.

3 class hours a week.

Credit, 3.

REVIEW MATHEMATICS S-3. I.

A course intending to bring into sharp focus the simple mathematics which is used in vocational forestry and without which such forestry cannot be intelligently practiced. Arithmetic, plane geometry and certain vocational uses of trigonometry are taught.

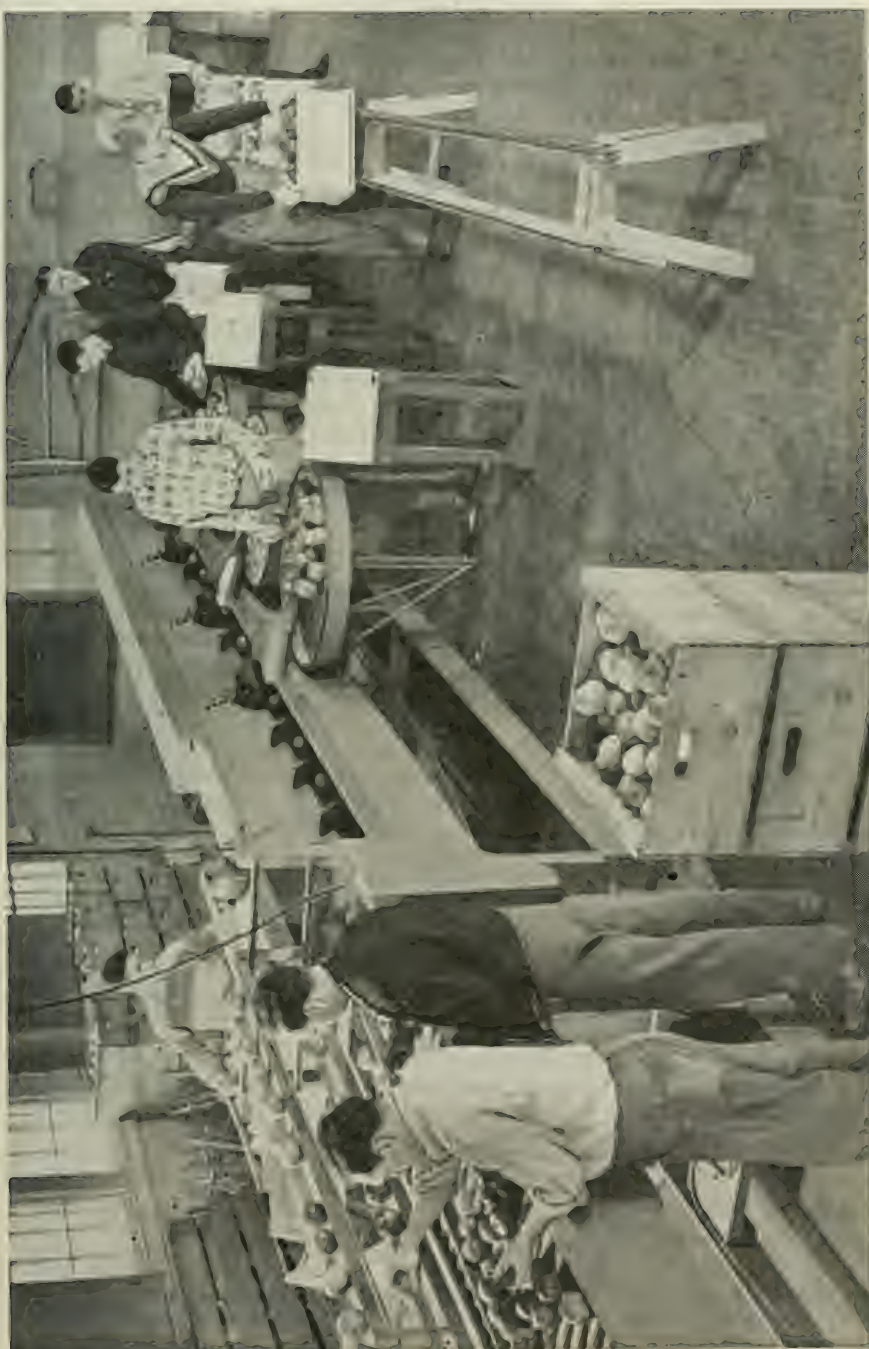
3 class hours a week.

Credit, 3.

Although Massachusetts is predominately an urban-industrial state with 90 percent of its people living in towns and cities, agriculture is one of the top three industries of the State.

Ninety-five percent of Massachusetts' land area is open rural countryside. Ten percent of our population (about 430,000) live comfortably in these areas. About one-third of these rural folks (141,000) live on the 30,000 farms and depend upon agricultural production as the principal source of income.

The Massachusetts farm industry represents an investment in land, buildings, equipment and live stock of over 300 million dollars. Its gross income for 1946 was approximately 175 million dollars.



GRADING APPLES

FRUIT GROWING

PROFESSOR FRENCH, ASSOCIATE PROFESSOR ROBERTS, ASSISTANT PROFESSOR
ANDERSON, MR. JAMES ANDERSON

The course in Fruit Growing prepares the student for successful participation in the activities of our many sided fruit industry. An essentially practical course, it emphasizes also the basic principles of plant growth which underlie sound cultural practices and the economic principles which bear upon marketing procedures and the business side of fruit growing. It provides a foundation on which increasing effectiveness may be developed through continued practical experience.

The University has about fifty acres of fruits easily reached from the classroom, which are used freely for purposes of illustration and study. Most of the tree and small fruits commonly found in New England are grown here on a commercial scale. Many experiments and tests are in progress in the plantations, offering exceptional opportunities to the student for the practical study of plant reactions under many and varied conditions. Excellent commercial orchards near the campus provide a wealth of additional material for observation and study. Large markets are visited to afford valuable contacts with the main channels of crop distribution.

Equipment for instruction includes a modern storage and packing house in which there are several types of refrigerated and common storage, a quick freezing unit, and zero temperature holding rooms. The principal types of orchard tools and machines, such as tractors, plows, harrows, cultivators, sprayers, dusters, and pruning and grafting tools are available for study and trial by students. Emphasis is placed on life histories and methods of control of all important insect, fungus and other pests. Materials used in pest control are also studied.

Graduates of the course in Fruit Growing are found in positions of responsibility all over the Northeast. Some have established successful fruit farms of their own. Others, after gaining added practical experience, have risen to positions as managers or foremen in large orchards. Still others have entered the industrial field and are employed by supply and equipment firms or are engaged in marketing activities. Fruit Growing is an active and thriving industry which offers a field of continuing interest and many opportunities for profitable development to the earnest student.

Combination Courses: Fruit growing lends itself readily to combination with other branches of agriculture. The fruit course is already broad and includes most of the information likely to be needed by the student, but for special interests the following are suggested: Fruit Growing and Beekeeping, Fruit Growing and Live Stock, Fruit Growing and Poultry, Fruit Growing and Vegetable Growing, or small fruits with Floriculture.

Trains for Jobs Like These:

Skilled workers on fruit farms, operators, foremen, owners; packing house operators, managers of sales and distribution. Salesmen for commercial spray materials, orchard equipment, and fertilizers; fruit inspection and grading. Growers of specialty fruit crops.

Field trips will be required during the two years at an estimated cost of \$25 per student.

Fruit Growing**First Year****First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Engineering S1 (Farm Power)
 Agronomy S1 (Soil Management)
 Botany S1 (Tree Physiology)
 Fruit Growing S1 (Growing Tree Fruits)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Physical Education S1 is required of men students not participating in football; also required of women students.

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agricultural Engineering S14 (Repair of Farm Equipment)
 Agronomy S2 (Fertilizers)
 Fruit Growing S2 (Orchard Pruning)
 Public Speaking S2
 Poultry Husbandry S10 (General Poultry Husbandry)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Agricultural Economics S1 (Farm Economic Problems)
 Agricultural Engineering S9 (Drainage and Farm Structures)
 Beekeeping S1 (Fall Management, Wintering, Honey, and Bee Diseases)
 Business English S1
 Fruit Growing S5 (Harvesting, Packing, Storage and Marketing)
 Vegetable Growing S7 (Commercial Vegetable Culture)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Beekeeping S2 (Spring Management, Pollination and Honey Production)
 Farm Management S2 (Farm Management and Accounts)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Fruit Growing S6 (Advanced Fruit Growing)
 Fruit Growing S8 (Small Fruits)
 Vegetable Growing S6 (Marketing Methods)
 Vegetable Growing S8 (Commercial Vegetable Culture)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

FRUIT GROWING S-1. (Growing Tree Fruits) I.

This course covers the planting and development of orchards and the management of bearing trees. The nature of the tree itself is stressed as the basis of sound cultural practices. The selection of sites and soils and varieties is studied for plantations of apples, pears, peaches, plums, and cherries. The handling of young trees to bring them into early profitable bearing is given special attention.

The culture of bearing orchards is studied in detail to give an understanding of the factors that influence yield and quality of fruit. Methods of soil management are considered with reference to their long-time effects on tree and soil. The experimental plots afford exceptional opportunities to study cultural methods and many subjects are discussed in the orchards.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR FRENCH AND MR. JAMES ANDERSON.

FRUIT GROWING S-2. (Orchard Pruning) II.

This course aims to give the student a thorough training in the underlying principles and the practice of pruning apples, pears, peaches, cherries and plums. The bearing habit of each fruit is studied as a basis for effective pruning. Practice pruning in the University orchards is stressed as an important feature of the course. Instruction and practice in budding and grafting are included in this course. Bridge grafting and top working are given special attention.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS AND MR. JAMES ANDERSON.

FRUIT GROWING S-4. (Fruit Pests and Spraying) II.

This course deals with the characteristics and behavior of insect and disease pests which attack fruit plants. Particular attention is given to the vulnerable points in their life cycles at which control measures are directed. A study of the principal spray materials and their uses is an essential part of the course.

The construction and care of spraying and dusting equipment is emphasized and students are required to use various types of implements in spraying and dusting trees in the orchard.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-5 (Harvesting, Packing, Storage, and Marketing) I.

Handling the crop from tree to consumer is the field covered by this course. Methods of harvesting and appliances used are studied in the orchards. Practice in packing the most popular containers forms a prominent part of the laboratory work.

The principles of common and refrigerated storage are considered in detail and storage house construction is discussed with a critical examination of several storages in use on or near the campus. Marketing methods as they relate both to distant and to local markets are given special consideration. A two-day field trip is a part of the course. Estimated cost, \$10.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS.

FRUIT GROWING S-6. (Advanced Fruit Growing) II.

This course involves a critical study of tree behavior as a basis for orchard management. Information acquired in other courses and in placement training is brought to bear on important orchard problems. It is the aim of the course to familiarize the student with conditions under which fruit must be grown here, with current thought on the more recent developments, and with adjustments which are being made in the fruit industry of the Northeastern States.

Each student must be prepared to take one or more trips to prominent orchards or to leading fruit sections of the Northeast. Estimated cost, \$15.00.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSOCIATE PROFESSOR ROBERTS.

FRUIT GROWING S-7. (Small Fruits) I.

This course is similar to Fruit S-8, but is given for students majoring in fields other than Fruit Growing.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-8 (Small Fruits) II. (For Fruit Majors Only)

There are many unusual opportunities in Massachusetts for success in growing small fruits. This course deals with the establishment and management of plantations of strawberries, raspberries, blackberries, blueberries, currants, cranberries, and grapes. The aim is to make the course of the utmost practical value as well as to give an understanding of the fundamental principles on which practices are based.

The University has plantations of these fruits except cranberries which are used freely for laboratory purposes. Berries which ripen in summer are frozen and held in excellent condition for study in this course.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR ANDERSON.

FRUIT GROWING S-9. (General Course) I.

This course is intended to meet the needs of students in other majors who can devote one semester only to the subject of Fruit Growing. It deals with the practical side of growing tree and small fruits for home use and market. Special attention is given to such questions as selection of sites, choice of varieties, grafting, pruning, spraying, soil management, harvesting, and storing. (Horticulture and Poultry majors.)

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. JAMES ANDERSON.

FRUIT GROWING S-10. (General Course) II.

This course is a repetition of Fruit Growing S-9 primarily for the benefit of first year students who are specializing in Animal Husbandry.

4 class hours and 1 2-hour laboratory period a week.

Credit, 5.

MR. JAMES ANDERSON.

To provide food enough for only "fairly adequate diets" for all of the people of the United States 10 years hence, would require as many poultry products as are now produced, more fruits, 50 percent more vegetables and a third more dairy products. Per capita consumption of these commodities is increasing. Fortunately these are the important farm products produced in Massachusetts.

Massachusetts farmers are producing more now than ever before,—in their 327 years of history. Whether or not Massachusetts agriculture will continue to expand and prosper with the increasing demands for our products, depends upon our ability to increase farm production efficiency through research, education, and the adoption of improved practices such as animal breeding and feeding, plant breeding and fertilization, saving labor, and raising part of our own feed nutrients through improved hay and pasture production.



ORNAMENTAL HORTICULTURE

ORNAMENTAL HORTICULTURE

PROFESSOR BLUNDELL, MR. PROCOPIO, MR. _____.

The constantly increasing interest in development of grounds, both public and private, for use and enjoyment, has created a demand for men trained to handle the varied problems in the construction and maintenance of these grounds. The course in Ornamental Horticulture aims to make the student familiar with these various problems.

Men who have taken this course are to be found in such different jobs as foremen in nurseries, or proprietors of nurseries which they themselves have developed; superintendents on private estates, cemeteries, parks, and various public and private institution grounds; foremen for landscape construction firms, and some have organized their own business in landscape construction and grounds maintenance service.

With the whole campus as a laboratory, the student every day finds problems about him comparable to those he will meet when he goes out to work. The broad lawns, the walks and drives, the gardens, the greenhouses, the orchards, the vegetable plots, as well as the farms, supply all the various phases of work which will be encountered on estates, in parks, or in institution ground of plant knowledge; in identification; in propagation which is carried on what these problems are and to solve them himself under expert supervision.

On the campus is to be found a large and excellent collection of mature trees, shrubs, and vines. From these plants the student is able to build up a background of plant knowledge; in identification; in propagation which is carried on in a special greenhouse for the purpose; in the handling of plants in various stages of their growth, in the nursery and on the campus; and in their ultimate care, pruning and protection against injuries of all kinds. Construction of roads, walks, drainage and other problems involving the moving of earth are especially valuable to those looking forward to landscape construction.

Trains For Jobs Like These:

Skilled workers in plant nurseries; gardeners, foremen or superintendents on private estates, public parks, cemeteries, and various public and private institution grounds such as state and government cantonments and hospitals, colleges and private schools; workers or foremen with landscape construction companies, real estate developments; owners and operators of small landscape maintenance businesses and nurseries, salesmen for seed and nursery concerns, plant propagators, town or city watershed foresters, botanic garden foremen.

A special requirement for students in Ornamental Horticulture is one draftsman's set estimated at \$25 and secured at the University store.

Field trips will be required during the two years at an estimated cost of \$20 per student.

Ornamental Horticulture

First Year

First Semester

(Sixteen Weeks Resident Instruction)
 Agronomy S1 (Soil Management)
 Agronomy S5 (Construction and Maintenance of Fine Turf Areas)
 Floriculture S1 (Garden Materials)
 Horticulture S1 (Plant Materials)
 Public Speaking S1
 Vegetable Growing S1 (Principles of Vegetable Culture)
 Physical Education S1 (Required of men students not participating in football; also required of women students)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
 Agronomy S2 (Fertilizers)
 Botany S2 (Diseases of Trees and Shrubs)
 Entomology S2 (Insect Pests of Ornamental Trees, Shrubs, and Flowers)
 Horticulture S2 (Plant Propagation)
 Public Speaking S2
 Vegetable Growing S2 (Principles of Vegetable Culture)

Elective

Physical Education S4 (Basketball and Hockey)

Second Year**First Semester**

(Sixteen Weeks Resident Instruction)
 Business English S1
 Floriculture S3 (Greenhouse Management)
 Forestry S3 (Woodland Management)
 Fruit Growing S9 (General Course)
 Horticulture S3 (Surveying and Mapping)
 Horticulture S7 (Grounds Maintenance)
 Physical Education S5 (Required of men students not participating in football; also required of women students)

Second Semester

(Sixteen Weeks Resident Instruction)
 Floriculture S8 (The Uses of Herbaceous Plants)
 Fruit Growing S4 (Fruit Pests and Spraying)
 Horticulture S4 (Landscape Construction Problems)
 Horticulture S6 (Plant Materials)
 Horticulture S8 (Grounds Maintenance)

Electives

Physical Education S4 (Basketball and Hockey)
 Physical Education S6 (Baseball)

HORTICULTURE S-1. (Plant Materials) I.

Study of evergreen and deciduous trees used in landscape work, their distinguishing characters, and culture, with special reference to nursery and planting practice.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR BLUNDELL.

HORTICULTURE S-2. (Plant Propagation) II.

This course will present the principles of plant propagation with special reference to their application to plant materials in nursery and greenhouse practice. The lectures are concerned with careful explanation of seedage, cuttage, graftage, layerage and division. In the laboratory the student propagates plants by each of these methods.

2 class hours and 2 2-hour laboratory periods a week.

Credit, 4.

MR. PROCOPIO.

HORTICULTURE S-3. (Surveying and Mapping) I.

Practice in the use of simple surveying instruments as tapes, compasses and levels used in the measurement of land surfaces, and the application of these instruments in landscape construction.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR.

HORTICULTURE S-4. (Landscape Construction Problems) II.

Continuation of Horticulture S-3, including the reading of landscape plans, figuring construction cost on grading work and garden construction problems, and setting stakes for landscape development from working drawings.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR.

HORTICULTURE S-6. (Plant Materials) II.

Study of shrubs, both evergreen and deciduous, woody vines, to enable the student to recognize the plants used in ornamental plantings and to familiarize him with the handling of these plants both in nursery practice and landscape work. A two-day field trip will be required. Estimated cost, \$10.00.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR BLUNDELL.

HORTICULTURE S-7. (Grounds Maintenance) I.

A course based upon the formulation and study of a work program which considers those essential operations contributing to successful horticultural management of grounds. The care of woody ornamental plants is included under the following heads: planting, pruning, maintenance of soil fertility, winter protection, and pest control.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. PROCOPIO.

HORTICULTURE S-8. (Grounds Maintenance) II.

A continuation of Horticulture S-7, taking up spring practices in grounds maintenance and nursery culture. Laboratory work emphasizes the development of supervisory capacity. First half of semester will be devoted to lectures and report work; the last half to lecture and laboratory work.
3 class hours a week, first half of semester.

1 class hour and 1 4-hour laboratory period a week, last half of semester.

Credit, 3.

MR. PROCOPIO.

TURF MAINTENANCE

ASSOCIATE PROFESSOR DICKINSON, MR. CORNISH

There is an immediate need for skilled supervisors and assistants to park, cemetery, and recreation area superintendents. Municipal and private golf clubs are expecting that their superintendents shall be trained in turf maintenance. Every city and large town offers splendid opportunities for the private business horticulturist who is especially well trained to "take care of the lawn."

As the many proposed memorial parks, play fields, public buildings and golf courses are being constructed and completed, the demand for specialists in turf maintenance will be increased and the number of replacements needed annually will be large.

This course is arranged and taught in such a manner that a student who has completed the work will be well qualified to accept a position as assistant or the actual superintendency of a small park, cemetery, or golf course, or to establish a business in his community.

Laboratory and field exercises give practical experience and demonstrations. Good equipment is supplemented by loans from manufacturers and supply houses. The supporting courses are strong and have been carefully chosen for their close alliance to the problems of turf maintenance and general estate work.

Each student's placement training and special interest will be considered in his chosen field, whether it be park, cemetery, golf course, or private business, and professional men will visit the classes to give of their experiences. Every student will be required to keep a record of work done, results obtained, and observations made during the placement training period, for use during the senior year.

Positions Capable of Holding at Graduation:

Assistant to superintendents or as an actual superintendent on golf course, cemetery, a park, or with a commercial nursery or landscape service company, also with golf course construction companies and equipment supply dealers.

At least one field trip will be required during the second semester of the senior year. The total cost of such a trip or trips to each student will not exceed \$20.00.

Turf Maintenance

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S1 (Soil Management)
Agrostology S1
Agrostology S3 (Uses and Requirements of Turf Areas)
Floriculture S1 (Garden Materials)
Horticulture S1 (Plant Materials)
Public Speaking S1
Physical Education S1 (Required of men students not participating in football)

Second Semester

(Eight Weeks Resident Instruction Followed by Six Months Placement Training)
Agronomy S2 (Fertilizers)
Agrostology S2 (Construction of Turf Areas)
Agrostology S4 (Maintenance of Turf Areas)
Botany S2 (Diseases of Trees and Shrubs)
Entomology S6 (Turf Insects)
Public Speaking S2

Elective

Physical Education S4 (Basketball and Hockey)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S3 (Farm Shop)
Agronomy S7 (Soil-Plant Relationships)
Agrostology S5 (Application of First Year Courses)
Agrostology S7 (Disease Controls)
Arboriculture S1 (Lectures)
Business English S1
Horticulture S3 (Surveying and Mapping)
Horticulture S7 (Grounds Maintenance)
Physical Education S5 (Required of men students not participating in football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S2 (Farm Power)
Agrostology S6 (Turf Maintenance as a Business)
Agrostology S8 (Layout and Construction of Turf Areas)
Arboriculture S2 (Lectures)
Floriculture S8 (The Uses of Herbaceous Plants)
Horticulture S4 (Landscape Construction Problems)

Electives

Physical Education S4 (Basketball and Hockey)
Physical Education S6 (Baseball)

AGROSTOLOGY S-1. I.

This course provides a background for the succeeding courses. The numerous aspects that enter into professional turf growing are introduced and correlated with each other and the actual growing of grass.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-2. (Construction of Turf Areas) II.

Construction of turf areas. Influence of foundation, subsoil, and topsoil zones. Talks preliminary to placement training. Adaptation of Agronomy S-1.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-3. (Uses and Requirements of Turf Areas) I.

Uses and requirements of turf areas. Grass seed and plant characteristics, identification and adaptation. Germination of seeds and growing of plants.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-4. (Maintenance of Turf Areas) II.

Maintenance of turf areas. Fertilizing, weeds, clipping and watering, with practical work and problems. Adaptation of Agronomy S-2.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-5. (Application of First Year Courses) I.

Thorough resume of the summer work by students, discussing labor, operations, equipment, and results. Application of first year courses. Diagnosis of turf troubles.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-6. (Turf Maintenance as a Business) II.

Turf maintenance as a business. Costs, purchasing and reports.

3 class hours a week.

Credit, 3.

ASSOCIATE PROFESSOR DICKINSON.

AGROSTOLOGY S-7. (Water Systems and Disease Controls) I.

Part I.—Layout and construction of golf course water system.

Part II.—Diseases, weeds, and insect pests, with their controls.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGROSTOLOGY S-8. (Layout and Construction of Turf Areas) II.

Construction of recreational areas, athletic field, airports, and cemeteries is studied in detail from the turf viewpoint. The design of golf courses is introduced. Contracting law and financing of turf construction contracts are discussed.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

RELATED SUBJECTS IN OTHER DEPARTMENTS

AGRICULTURAL ECONOMICS S-1. (Farm Economic Problems) I.

The purpose of this course is to introduce students to the more important economic problems facing New England farmers. Increasing competition with other farm sections, long-time movements of farm prices and farm profits, farm credit, farm taxation; tariffs and other farm relief measures are some of the problems to be considered.

2 class hours a week.

Credit, 2.

MR. CALLAHAN.

AGRICULTURAL ECONOMICS S-2 and S-3. (Marketing) I. II.

This course deals largely with economic problems arising out of marketing farm products. Particular attention is given to marketing methods used in New England and to the comparison of local methods with methods used by farmers in competing sections. Principles and methods of co-operative marketing used by successful co-operative associations are studied in detail in order to show how New England farmers may meet competition from associations in other sections, either as individual producers or as officers or members of local associations.

2 class hours a week.

Credit, 2.

MR. CALLAHAN.

AGRICULTURAL ECONOMICS S-5. (Dairy Business Accounting) I.

Business arithmetic and bookkeeping are given consideration. The mathematics of fat determination, ice cream mixes, etc., are studied. An understanding of elementary bookkeeping principles involved in milk distribution also forms a part of the course.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

THE DEPARTMENT.

AGRICULTURAL ENGINEERING S-1 and S-2. (Farm Power) I. II.

A study of the principles of the gasoline engine and its accessories, as used in trucks, tractors and power units; and the application of electricity to farm operations, with particular emphasis on the selection, care and maintenance of electric motors. Exercises cover trouble shooting and minor repairs to gasoline engines; and the selection of proper wire size, overload protection, and the electrical equipment for farm electric applications.

3 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR STAPLETON AND ASSISTANT PROFESSOR TAGUE.

AGRICULTURAL ENGINEERING S-3 and S-4. (Farm Shop) I. II.

The purpose of this course is to teach the student the manner in which adequate tools in a farm shop can assist in solving farm construction and maintenance problems. Instruction is given in the care and use of carpenter's tools through exercises in bench work, repair of farm equipment, and building construction, including the mixing and placing of concrete. Exercises covering domestic water systems and the repair of farm machinery give the student experience in arc and gas welding, pipe fitting, soldering, and the use of machinist's tools. While the time is too limited for the student to develop much skill, the capabilities of the equipment can be adequately demonstrated.

3 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR PUSHEE AND MR. PATTERSON.

AGRICULTURAL ENGINEERING S-6. (Dairy Mechanics) II.

Designed for men who are fitting themselves for work in dairy plants and allied work, this course covers the principles and equipment involved in processing and refrigeration of milk products, together with the instrumentation necessary for process control.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR PFLUG.

AGRICULTURAL ENGINEERING S-8. (Farm Structures) II.

A study of principles of design of farm buildings, utilizing elementary structural mechanics and the characteristics of building materials. Experience in developing construction details results from the complete planning of a major farm building by the individual student.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR STAPLETON.

AGRICULTURAL ENGINEERING S-9 and S-10. (Farm Structures and Drainage) I. II.

A study of building materials, details of construction, simple structural mechanics, and the principles of design applied to farm buildings. Each student will design in detail one of the major farm buildings in which he is particularly interested.

About one-fourth of the time is given to the study of land drainage practice and the use of the engineer's level in laying out drainage systems.

1 class hour and 3 2-hour laboratory periods a week.

Credit, 4.

ASSOCIATE PROFESSOR MARKUSON.

AGRICULTURAL ENGINEERING S-14. (Repair of Farm Equipment) II.

Instruction in the capabilities of arc and gas welding, soldering, pipe fitting, and machinist's tools in the repair and construction of farm machinery and miscellaneous farm equipment. Exercises cover the repair of machines and the study of pumps and water systems.

3 2-hour laboratory periods a week.

Credit, 3.

ASSISTANT PROFESSOR TAGUE.

AGRONOMY S-1. (Soil Management) I.

Every agricultural interest is vitally concerned with the soil, its adaptations and its management for plant production. This course treats of the selection of suitable soils for the special purposes of agriculture, horticulture and floriculture.

Laboratory includes training in the use and interpretation of the maps of the U. S. Soil Survey and in tests of soil texture, organic matter and soil acidity. Practical field work will be given in judging the crop adaptation and value of soils.

As a field project the student will be required to make a study of some farm, nursery or florist's plant, from the standpoint of soil conditions and methods of soil management in relation to the enterprise as a whole.

2 class hours and 1 3-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR THAYER, MR. ZAK
AND TEACHING FELLOWS.

AGRONOMY S-2. (Fertilizers) II.

This course deals with the origin, manufacture, purchase and use of commercial fertilizer materials. A study will be made of the interpretation of fertilizer formula, analysis and guarantee. Special attention will be given to the newer concentrated fertilizer materials and to those produced from atmos-

pheric nitrogen. The laboratory work will give practice in the identification of fertilizer materials, in the calculation of fertilizer formulas, and in the preparation of fertilizer mixtures.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR THAYER, MR. ZAK,
AND TEACHING FELLOWS.

AGRONOMY S-4. (Field Crops) II.

The lecture hours of this course will be devoted to presentation and discussion of the most successful methods of fertilizing, cultivating, harvesting, and storing the field crops grown in New England. Special attention will be given to the choice of the best adapted varieties for the production of hay, pasture, corn, potatoes, and root crops.

The laboratory work will include the study of corn and potato varieties, identification of grass and weed species, and studies of purity and germination. Field observations of growing crops will be included as the season permits.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

MR. PARSONS.

AGRONOMY S-5. (Construction and Maintenance of Fine Turf Areas) I.

At the completion of this course the student should have a knowledge and appreciation of the requirements for the growing of lawns and sports turf.

He will have considered the construction of turf areas; seed identification, selection and sowing; the identification of turf grasses and their soil and fertilizer preferences, correct cultural practices, turf diseases and pests and their control.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

MR. CORNISH.

AGRONOMY S-7. (Soil-Plant Relationships) I.

Elementary soil chemistry and soil physics are related to fundamental plant physiological processes. The absorption, utilization, and functions of nutrient elements by plants are related to their occurrence, chemical changes, and supply in soils.

2 class hours a week.

Credit, 2.

PROFESSOR SIELING.

BACTERIOLOGY S-1. (Bacteriology and Rural Hygiene) I.

The reproduction, structure, growth, changes produced by the action of bacteria upon various substances and the methods by which disease producing bacteria of man and animals are disseminated will be studied. The proper use of disinfectants, vaccines and serums in the control and treatment of disease will be discussed. The purpose of the course is to present the problems of applied bacteriology in health, agriculture and industry. The sanitary production, handling and distribution of milk involving human and environmental contacts with a food often consumed raw is an important problem to be controlled by responsible citizens of the community. Discussions on milk include the various sources of milk infections, methods of controlling sanitary production and marketing and the detection and elimination of milk dangerous to the public health.

Water supplies are of especial importance to man. The construction of wells, cisterns, etc., will be briefly considered and the application of sanitary measures to prevent and control their pollution will be discussed. The proper treatment and disposal of private and municipal sewage presents a problem of no small importance. Work has been planned in this course to present some of the problems pertaining to the sanitary production and distribution of foods.

This course is designed to acquaint the student with the nature and im-

portance of micro-organisms and thus better explain biological changes in nature and susceptibility to disease. (Animal Husbandry, Poultry Husbandry, and Dairy Industry majors.)

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR PERRIELLO AND MR. LARKIN.

BACTERIOLOGY S-4. (Dairy Bacteriology) II.

Bacteria and other micro-organisms are the responsible agents for changes which occur in milk, and for the contagion which sometimes causes disease. They are found in milk at times when leaving the udder. They get in with the dust and dirt while milking and they adhere to the dairy utensils which carry them over from one milking to the next. From cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster on the other.

Many of these changes occurring in milk are undesirable, such as ropy milk, sour milk, bitter milk, tainted milk, etc. Many of these changes are encouraged as the ripening of cream for butter, of milk for cheese, of milk for milk drinks. The former are fought, the latter fostered.

Micro-organisms of typhoid fever, scarlet fever, diphtheria and other diseases find their way by means of milk to the consumer and produce epidemic forms of these diseases.

Various bacteriological tests for the estimation of the numbers and types of organisms in milk are studied. Special attention is given to the interpretation of results indicated by the standard plate, Breed, methylene blue, and Burri methods of testing milk quality. Laboratory procedures for the determination of special groups of bacteria not normally found in milk, such as fecal contaminants and heat resistant organisms, are discussed. The proper use of these methods will quickly enable one to locate the source of trouble and check any further continuance.

It is evident, therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of this course, which is required of all students who elect dairying as one of their special lines of work.

1 class hour and 2 4-hour laboratory periods a week.

Credit, 5.

ASSISTANT PROFESSOR PERRIELLO AND MR. LARKIN.

BEEKEEPING S-1. (Fall Management, Wintering, Honey, and Bee Diseases) I.

The students are given an opportunity for individual handling of bees in the early fall, and field studies are made of the bee colony and its organization. Studies and practice in fall management are followed by a similar treatment of winter protection and the bees are then prepared for winter. During the latter part of the semester the surplus honey is extracted and prepared for market, a laboratory study made of the product and, finally, the commoner bee diseases are discussed and methods of control pointed out.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR SHAW.

BEEKEEPING S-2. (Spring Management, Pollination, and Honey Production) II.

The first part of the semester is occupied in assembling and studying the equipment used in beekeeping, but as soon as the weather permits, work is resumed on the bees in the apiary. Studies are made in spring management; pollination in the apple orchards is particularly stressed, and attention is then turned to the preparation of the colonies for honey production.

Throughout the entire course, wherever possible, the work is made practical and individual, enough theory being given so that the student will understand the reasons for his manipulations.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR SHAW.

BOTANY S-1. (Tree Physiology) I.

A study of the processes occurring in trees and their relation to the complex of activities constituting plant growth. Topics include basic considerations of anatomy and physiology of roots, stems and leaves. Absorption, transpiration, internal water relations, food synthesis, digestion, translocation and growth receive appropriate elementary treatment.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

PROFESSOR KOZLOWSKI.

BOTANY S-2. (Diseases of Trees and Shrubs) II.

A survey course dealing with the cause, nature, and general procedures of plant disease control. The profound influence environment exerts on plant disease, the role played by insects in their transmission and the major classes of plant pathogens, fungi, viruses and bacteria are briefly considered.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR BANFIELD.

BUSINESS ENGLISH S-1 and S-2. I. II.

This course is designed to cover review work in the fundamentals of grammar and composition, and to give students training and practice in writing various types of business letters and reports.

3 class hours a week.

Credit, 3.

ASSISTANT PROFESSOR DuBOIS, MRS. WRIGHT.

BUSINESS MANAGEMENT S-1. I.

This course is designed primarily for students majoring in Floriculture. It involves a study of records and accounts used by florists; costs and prices; uses of capital and credit; house and store management; advertising; buying and selling; economic use of labor and equipment; general business trends as affecting the flower business; how the florist should make adjustments to meet economic changes; analyses of going concerns; and finally a bringing together of all information studied and applying it to the successful organization of a business. The entire course is to be made as applicable and practical as possible.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR LINDSEY.

BUSINESS MANAGEMENT S-3. I.

This course is designed primarily for students majoring in Dairy Industry. The principles of business organization and management are considered in relation to the successful operation of a dairy plant. The course includes a study of the following: various records and accounts used by dairies; costs and prices; uses of capital and credit; economic trends as affecting the business; how to make adjustments in the business to meet economic changes; analyses of different types of going concerns; and finally a bringing together of all the information studied and applying it to the successful organization of a business.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR LINDSEY.

ENTOMOLOGY S-2. (Insect Pests of Ornamental Trees, Shrubs, and Flowers) II.

A course designed to acquaint the student with the major pests of the plants mentioned. Class will be divided: Arboriculture and Ornamental Horticulture students in Section I; Floriculture students in Section II.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

MR. FIELD.

ENTOMOLOGY S-6. (Turf Insects) II.

A course designed to acquaint the student with the principal pests of turf. General introduction to Entomology, followed by study of specific pests of turf.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

ASSISTANT PROFESSOR HANSON.

FARM MANAGEMENT S-1 and S-2. (Farm Management and Accounts) I. II.

The work in this course involves a study of farm records and accounts; costs and prices of farm products; uses of capital and credit; types of farming, selection of crop and live stock enterprises; size, diversity and production as related to the successful farm business; farm layout and arrangement; economic use of labor, power and equipment; detailed analysis of both successful and unsuccessful farms, how the farmer should make adjustments to meet economic changes; and finally, a bringing together of the information gained and applying it to the successful organization of a farm business.

Actual farm records are used to illustrate the above points. The entire course is made as applicable and practical as possible.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

PROFESSOR BARRETT.

Note.—Farm Management will be given both semesters. The first semester will be for students majoring in Animal Husbandry; the second semester for students majoring in Poultry Husbandry, Fruit Growing and Vegetable Growing.

FARM MANAGEMENT S-3. (Efficiency in Farming Operations) I.

For Freshmen. This is an introductory course to the regular Farm Management work which comes in the second year. It is in no sense a theoretical consideration but rather a study of the practical aspects of the efficiency of the many day-to-day jobs found on various types of farms. In brief, a careful analysis is made of the "one best way" of doing the jobs. The course involves a study of farm layout, building layout, economical use of machinery and equipment, and efficiency in hand operations. The primary objective is to point out ways of reducing farm labor costs. Motion pictures will be used to illustrate good methods versus poor or inefficient methods.

1 class hour and 1 2-hour laboratory period a week.

Credit, 2.

PROFESSOR BARRETT.

FOOD TECHNOLOGY S-2. (Basic Principles, Freezing, Canning and Pickling) II.

Principles of food preservation including refrigeration and modern locker storage management are covered. Work is given in the use of packaging materials and the examination and grading of food products. Three field trips will be required. Estimated cost \$10.00.

Note: This is a full semester course for Freshman Food Management and Senior Vegetable Growing majors; one-half semester course for Freshman Dairy Industry majors.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

MR. NEBESKY.

FOOD TECHNOLOGY S-4. (Special Products) II.

The class and laboratory exercises in this course are planned to meet the needs of students majoring in Dairy Industry. General principles of food preservation and their application to the subject of dairying are discussed in class exercises. Crushed fruits, fruit juices, syrups, flavored syrups and other products which are utilized in the dairy trade are manufactured and tested.

1 class hour and 2 2-hour laboratory periods a week.

Credit, 3.

ASSOCIATE PROFESSOR LEVINE.

FORESTRY S-3. (Woodland Management) I.

The first part of this course is devoted to the study and practice of the principles of timber volume estimating and forest mapping. The field work for both parts includes practical problems in forest management.

1 class hour and 1 4-hour laboratory period a week.

Credit, 3.

PRACTICAL SCIENCE S-7 and S-8. I. II.

This is a course in applied sciences, chiefly in the fields of chemistry and physics, as they are tools serving the needs of the food and dairy industries. In general, the course is designed to give an introduction to scientific thought and phenomena by means of lectures, textbook study and classroom demonstrations. The emphasis is entirely built around the practical problems in the student's field of work. Practical Science S-8 is a full semester course for Food Management majors.

2 class hours and 1 2-hour laboratory period a week.

Credit, 3.

ASSISTANT PROFESSOR EVERSON.

PUBLIC SPEAKING S-1 and S-2. I. II.

The aim of the course is to give the student confidence in himself while speaking before groups, and to have him acquire some knowledge of, and practice in, the more practical types of public speaking.

1 class hour a week.

Credit, 1.

ASSOCIATE PROFESSOR NIEDECK, MR. ZAITZ,
MR. STELKOVIS.

VETERINARY SCIENCE S-1. (Animal Sanitary Science) I.

Sections for Animal Husbandry, Dairy Industry, and Poultry Husbandry Major students. Conservation of the health of animals is the keystone of successful animal husbandry. This course acquaints students with the essentials upon which the health of animals depends. In order that students may later guard the animals in their charge, attention is given to conditions favoring communicable and non-communicable diseases, and to prophylactic measures.

3 class hours a week.

Credit, 3.

PROFESSOR LENTZ AND ASSOCIATE PROFESSOR SMITH.

VETERINARY SCIENCE S-2. (Applied Animal Sanitary Science) II.

A continuation of S-1. The Animal Husbandry section will study the more common diseases of cattle, horses, sheep, and swine, and the Poultry Husbandry section will study poultry diseases. Causes; development; emergency; control; eradication; and prophylactic measures will be emphasized.

3 class hours a week.

Credit, 3.

PROFESSOR LENTZ AND ASSOCIATE PROFESSOR SMITH.

PHYSICAL EDUCATION FOR WOMEN

PROFESSOR TOTMAN

This program aims at an all-round development of the student. It gives the student activity adapted to her needs; assists in overcoming remediable physical defects and bad health habits; it encourages good health standards, helps her build up skill in sports and games and swimming and leaves her with possibilities for spending leisure time wisely.

REQUIRED COURSES

PHYSICAL EDUCATION S-1. I.

Outdoor season—field hockey, archery, tennis, swimming, volleyball. Indoor season—badminton, special gymnastics, games, swimming, dancing.

3 class hours a week.

Credit, 2.

THE DEPARTMENT.

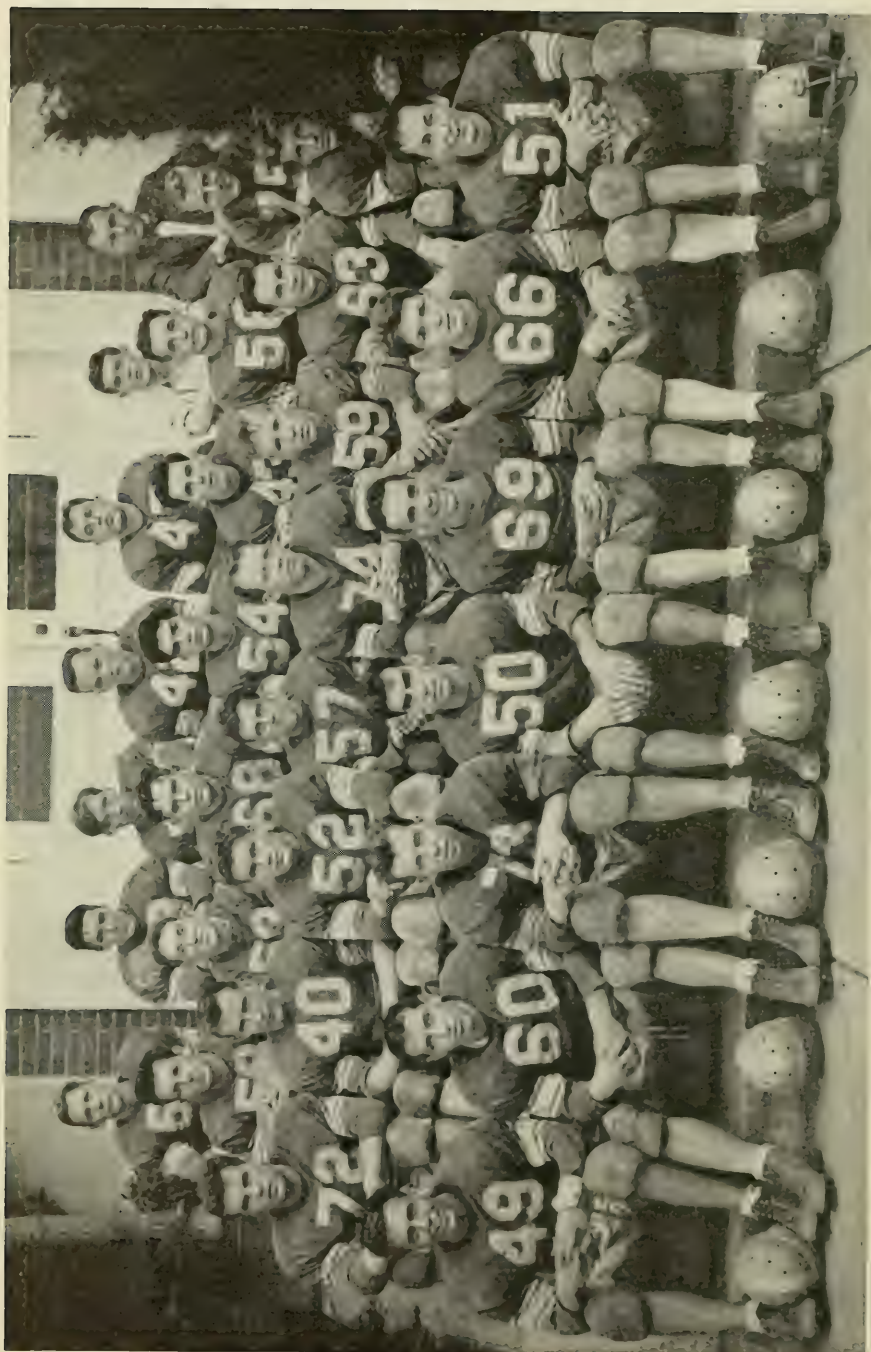
PHYSICAL EDUCATION S-5. I.

The senior program is arranged to give the student an opportunity to express her desire for wholesome physical recreation, to further develop desirable character traits and social qualities and qualities of leadership.

3 class hours a week.

Credit, 2.

THE DEPARTMENT.



1949 STOCKBRIDGE FOOTBALL TEAM.

PHYSICAL EDUCATION FOR MEN

PROFESSOR GORE, MR. KOSAKOWSKI, ASSISTANT PROFESSOR DERBY,
ASSISTANT PROFESSOR ROGERS.

REQUIRED COURSES

PHYSICAL EDUCATION S-1. I. (Recreation.—For Freshmen. Outdoor games.)

The following outdoor games are taken up: Softball, touch football, and swimming. Men may elect football or cross-country. The course aims to give every man the opportunity to develop sufficient control over his body to enable him to get pleasure from physical activities and to establish correct health habits. Not required of veterans.

2 laboratory hours a week for first half semester.

Credit, 1.

MR. KOSAKOWSKI, ASSISTANT PROFESSOR ROGERS.

PHYSICAL EDUCATION S-5. I. (Recreation.—For Seniors. Outdoor games.)

Includes the games of volleyball, softball and swimming, with the object of giving the men exercise material for use in after school days. Men may elect football or cross-country. Not required of veterans.

2 laboratory hours a week for first half semester.

Credit, 1.

MR. KOSAKOWSKI AND THE DEPARTMENT.

ELECTIVE COURSES

PHYSICAL EDUCATION S-4. II. (Recreation.—For freshmen and seniors.)

(Basketball and Indoor Track.) January-March.

Students electing this course must be regular members of the basketball, or indoor track squads and report regularly for practice with those squads.

Credit, 1.

MR. KOSAKOWSKI AND THE DEPARTMENT.

PHYSICAL EDUCATION S-6. II. (Recreation.—For seniors.)

The senior class is divided into three or four major groups according to the number of students electing the spring physical education program. An intra-mural softball league schedule is played and an indoor and outdoor track meet run off. The group winning the highest average in all three events will have its name engraved on the Stockbridge School spring athletic trophy.

Credit, 1.

MR. KOSAKOWSKI AND THE DEPARTMENT.

RED CROSS LIFE SAVING COURSE

ASSISTANT PROFESSOR ROGERS.

SHORT COURSES AT THE UNIVERSITY OF MASSACHUSETTS

Short courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore there is no age limit. Enrolled in short courses are the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty-five years Short Courses have served thousands of students in this Commonwealth, and the demand for these courses since the war has increased greatly due to both veteran and non-veteran demand.

DIRECTORY OF INFORMATION

A. The University

Those desiring University catalogs and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, and those with questions regarding admission to the university, either to the freshman class or to advanced standing should address William L. Machmer, Dean of the University, Amherst, Mass.

B. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Fred J. Sievers, Director of the Graduate School, Amherst, Mass.

C. Short Courses

For information concerning the Short Course Units, the Stockbridge School of Agriculture, write or apply to Roland H. Verbeck, Director of Short Courses, Amherst, Mass.

D. Correspondence Courses

Correspondence courses are offered in Commercial Vegetable Growing; Farm Management; Home Flower Gardening; Poultry Husbandry. For detailed information write to Professor Alden P. Tuttle, French Hall, University of Massachusetts, Amherst, Mass.

APPLICATION FOR ENROLMENT IN THE STOCKBRIDGE SCHOOL OF AGRICULTURE

Name Date

City or
Town Street State

Present Occupation Age

School or College Attended:

Name of School Number of Years
..... in High School

Place Are you a Veteran
..... under G.I. Bill?

Indicate by a check mark the course in which you desire to register. Do not check more than one.

- | | |
|---|-----------------------------------|
| 1. Animal Husbandry (Dairy Farming) | 7. Food Management (For Hotel and |
| 2. Dairy Industry (Dairy Plant Operation) | Restaurant Trade) |
| 3. Poultry Husbandry | 8. Forestry |
| 4. Arboriculture | 9. Fruit Growing |
| 5. Commercial Vegetable Growing | 10. Ornamental Horticulture |
| 6. Floriculture | (Landscape Gardening) |
| | 11. Turf Maintenance |

References.—I am personally acquainted with the above applicant, and know
to be of good moral character, industrious, studious, and physically capable. Not required of
veterans.

1. Name Position

Address

2. Name Position

Address

(Two references are required, and should not be members of your own family. Your min-
ister and your teacher, or a former employer, are desirable. These persons should sign the
application themselves.)

Mail this blank to **ROLAND H. VERBECK, Director of Short Courses**

UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS.

Important.—Be sure to file citizenship certificate if State tuition rate is claimed. Not required of
veterans.

FORM II

CERTIFICATE OF CITIZENSHIP

The University of Massachusetts charges a tuition fee of \$200 a semester to students who are
not residents of Massachusetts. In order to satisfy the university authorities that an applicant is
entitled to state tuition of \$50 a semester, they require a statement signed by the clerk of the city or
town in which the applicant resides, certifying to the fact that the parent or guardian of the appli-
cant is a legal resident of said city or town. Where the guardian is certifying to this statement, it
will be necessary for him to furnish copies of his appointment by the court. Such a statement may
be made on the form below. If this is not presented when the student registers, the Treasurer has
no option but to collect tuition on the above basis. When requesting the City Clerk to sign this cer-
tificate, an applicant for admission to the university should give the name and address of the parent
or legal guardian unless he himself is of legal age.

This is to certify that I am the father mother legal guardian

of
Student's Name

Signed

This is to certify that on the date specified below (Insert name of parent or guardian)

..... is a legal resident of

Parent's Name

....., Massachusetts.

Town or City

Signed

Town or City Clerk

Date

Seal

Mail this blank to **ROLAND H. VERBECK, Director of Short Courses**

UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS.

This certificate must be filed with application blank if lower tuition rate for citizens of Massachusetts
is to be secured. Not required of veterans.

GRADUATES — 1950

Ellis Nye Allen	Medfield, Massachusetts
John Thacher Allen	Worcester, Massachusetts
*Richard Lee Anderson	Framingham, Massachusetts
*William Patrick Ashe	Springfield, Massachusetts
Frederick Andrew Bangs	Lee, Massachusetts
*Norman Raymond Beach	Florence, Massachusetts
Kendall Knapp Bennett	Melrose, Massachusetts
*Joseph Daniel Bidwell	Granby, Connecticut
Louis Tuttle Bonitto	Hingham, Massachusetts
*John Desmond Braginton	West Harwich, Massachusetts
Bruce Allen Brown	Sterling, Massachusetts
Andrea Marie Bruneau	Tewksbury, Massachusetts
Roger Penniman Bryant	Needham, Massachusetts
Jairus Salls Burt	Easthampton, Massachusetts
John Louis Cande	Dalton, Massachusetts
*John Herbert Chambers	New Bedford, Massachusetts
*Harry Everette Charles, Jr.	Bradford, Massachusetts
Allen Seamans Chase	Shrewsbury, Massachusetts
*Roger Gibbs Coggeshall	Bourndale, Massachusetts
*Leonard Stuart Collis	Springfield, Massachusetts
Ralph Elliott Conway	Quincy, Massachusetts
*Everett Andrews Creighton, Jr.	Milton, Massachusetts
Wilton Campbell Dale	Worcester, Massachusetts
*Lawrence Richard Damour	Whitinsville, Massachusetts
*Carl Peter Deame, Jr.	Pittsfield, Massachusetts
Joseph Henry Deary	Webster, Massachusetts
Robert Greer Dewey	Longmeadow, Massachusetts
Aloysius John Donohue	North Grafton, Massachusetts
Henry Leonard Dooddy	Winchendon, Massachusetts
James Joseph Downing	Dedham, Massachusetts
Charles Edward Drake, Jr.	Amherst, Massachusetts
Joseph Duarte, Jr.	West Barnstable, Massachusetts
*Eugene Frank Dziza	Chicopee Falls, Massachusetts
*Robert Joseph Fahey	Milford, Massachusetts
*George Marshall Fellows, Jr.	Worcester, Massachusetts
Robert Julian Ferestien	Foxboro, Massachusetts
Manuel Fernandez	Southampton, Massachusetts
Maurice Howard Frost, Jr.	Saugus, Massachusetts
*Russell Friedrich Fuller	Springfield, Massachusetts
Norman Edward Ganley	Beverly, Massachusetts
Edwin George Gast	Ashland, Massachusetts
Allen Burns Gelinas	Edgartown, Massachusetts
*George John Gibavic, Jr.	Worcester, Massachusetts
Howard Gilbert Gold	East Longmeadow, Massachusetts
*John Paul Gorman	Woburn, Massachusetts
*Edward John Gorski	Chicopee Falls, Massachusetts
*Daniel Joseph Graham	Arlington, Massachusetts
*Robert Edward Grant	Northampton, Massachusetts
*Robert Haynes Guild	Berlin, Massachusetts
Carl William Haeseler	Northampton, Massachusetts
John George Handrahan	Cochituate, Massachusetts
Milton Emil Hansen	Granville, Massachusetts
*Glenn Weaver Harvey	Sharon, Massachusetts
*Leo Joseph Haverty	Leominster, Massachusetts
*Robert William Henrickson	Worcester, Massachusetts
*Frederick Theodore Heyliger	Acton, Massachusetts
*Peter Sherwin Hill	Brookline, Massachusetts
*Stanley Joseph Hollis	Cambridge, Massachusetts
*John Joseph Homich	Pittsfield, Massachusetts
*Dean Chapman Hooker	Holbrook, Massachusetts
John Houston	East Longmeadow, Massachusetts
Glover Elbridge Howe, Jr.	West Hartford, Connecticut
Robert Ernest Huntley, Jr.	Hanover, Massachusetts
*Robert Wesley Jackson	Attleboro, Massachusetts
Allen Lawrence Jacques	North Adams, Massachusetts
Alden Lee Johnson	Attleboro, Massachusetts
Harry Carl Johnson, Jr.	Rutland, Massachusetts
*Ralph Norman Johnson	Milton, Massachusetts
*Stewart Sanfred Johnson	West Townsend, Massachusetts
Stuart LeRoy Johnson	Sterling, Massachusetts
*Thomas Matthew Johnson	Taunton, Massachusetts
*Francis Leo Jolin	Medford, Massachusetts
*Raymond Douglas Jordan	Springfield, Massachusetts
Richard Carver Joseph	Norwell, Massachusetts
Frank William Judge	Holyoke, Massachusetts
*Charles Augustus Kearney, Jr.	Auburndale, Massachusetts
*Harold Morris Keith	Worcester, Massachusetts
Gladys Mae Kimball	Haverhill, Massachusetts
Kenneth Bashford Kirk	East Walpole, Massachusetts
John Frank Kulesa	Whately, Massachusetts
*Richard Francis LaBonte	Springfield, Massachusetts
Donald Raymond Lambert	Monson, Massachusetts
Herman Eugene Langevin	Southbridge, Massachusetts
*Eugene Albert Lapine	North Adams, Massachusetts
*Germain Ernest LaRoche	Dracut, Massachusetts
*Robert Francis Lauder	Amherst, Massachusetts
Leonard Morton Libbey	Belmont, Massachusetts
John Eugene Linnehan	Haverhill, Massachusetts
Philip Hollyday Livingston	Needham Heights, Massachusetts
Donald Herbert Long	Monument Beach, Massachusetts
Robert Gage Longden	Fairhaven, Massachusetts
Robert Walter Loomis	Shelburne Falls, Massachusetts

*Francis Stanley Mackiewicz	Abington, Massachusetts
*Paul Makliney	South Hadley, Massachusetts
Paul Edward Maynard	Melrose, Massachusetts
*John Matthew Mayo	Framingham, Massachusetts
*Fred Francis Mitchell, Jr.	Newton Center, Massachusetts
*John Lindsay Moodie, Jr.	Sturbridge, Massachusetts
Arthur Walter Morgan	Wakefield, Massachusetts
Edward Kendall Morgan, Jr.	Millbury, Massachusetts
Walter Dennis Moynihan	Springfield, Massachusetts
*Graydon William Mundell	Holyoke, Massachusetts
*Jeremiah Alphonus McCarthy	Roxbury, Massachusetts
Kenneth Elwin McCollister	Shirley, Massachusetts
Warren Chapin McKinstry	Chicopee Falls, Massachusetts
*Philip Clinton Nash	Westboro, Massachusetts
*Frederick William Nilges	Maynard, Massachusetts
*Alvin Earl Nix	Framingham, Massachusetts
*Gerald James O'Connor	Holyoke, Massachusetts
Charles Robert O'Halloran	Watertown, Massachusetts
Raymond Karl Olson	Northampton, Massachusetts
*James Conrad O'Neil	Fitchburg, Massachusetts
Robert George Osgood	Danvers, Massachusetts
Ernest Henry Page	Springfield, Massachusetts
Charles Rollin Parmelee	Holden, Massachusetts
*Howard Murray Peatfield	Hyde Park, Massachusetts
Rollin Wendall Perry	Revere, Massachusetts
*Kenneth Raymond Peterson	Worcester, Massachusetts
John Wells Phelon	Granville, Massachusetts
*George Alphonse Poirier	Taunton, Massachusetts
*George Edward Priest	Winchendon, Massachusetts
*Harold Libby Procter	North Weymouth, Massachusetts
*Robert Gordon Rafferty	Littleton, Massachusetts
Harry Alfred Rahm	Great Barrington, Massachusetts
William Chalmers Reed	Melrose, Massachusetts
*John Reynolds	Swansea, Massachusetts
Harold Alan Richardson	Woburn, Massachusetts
*George Edward Robinson	Framingham, Massachusetts
Charles Louis Rogers	Holyoke, Massachusetts
*Florian Edward Rogers	Belchertown, Massachusetts
*Albert George Rossner, Jr.	Westminster, Massachusetts
*William Ruminas, Jr.	Norfolk, Massachusetts
*James Henry Rush	Lexington, Massachusetts
James Cleophile St. Amand	Indian Orchard, Massachusetts
William Alexander Scott	Canton, Massachusetts
Ruth Elizabeth Sheehan	Holyoke, Massachusetts
*Salvatore Anthony Simeone	Natick, Massachusetts
Roy George Simmons	Becket, Massachusetts
Melvin David Small	Belchertown, Massachusetts
*Carlton Nelson Smith	East Bridgewater, Massachusetts
*Clayton Dana Smith	New Bedford, Massachusetts
David Gardner Smith	South Westport, Massachusetts
*Frederick Murray Smith	Northampton, Massachusetts
*George Franklin Smith	New Bedford, Massachusetts
*Raymond Griddley Smith	Belchertown, Massachusetts
Robert Leland Smith	South Westport, Massachusetts
*Richard Weston Spear	Norwood, Massachusetts
*William Earl Stauffer	Stoughton, Massachusetts
*Robert Westbrook Stelle	Holyoke, Massachusetts
John Carleton Stockbridge	Westfield, Massachusetts
*George Albert Stumpf, Jr.	East Hartford, Connecticut
*Ralph Richard Swedberg	Worcester, Massachusetts
Robert Adolph Szereyko	Worcester, Massachusetts
*John Hawley Tanner	Springfield, Massachusetts
*Paul Emmons Thayer, Jr.	Worcester, Massachusetts
*George Maynard Thomas	Boston, Massachusetts
*William Robert Thomas, Jr.	Stoneham, Massachusetts
*Lawrence Daniel Toomey	Arlington, Massachusetts
*Edward Leonard Valentine	East Chelmsford, Massachusetts
Ernest Frank Vieira	North Dartmouth, Massachusetts
William Francis Walsh	Peabody, Massachusetts
Raymond Donald Warnock	Easthampton, Massachusetts
*John Andrews Washburn	New Bedford, Massachusetts
*Russell William Watson	Worcester, Massachusetts
William Arthur Watson	Belmont, Massachusetts
*Paul Weldin, Jr.	Wilmington, Delaware
*Harry Wardman Wells	Longmeadow, Massachusetts
Charles Joseph Wenk, Jr.	Springfield, Massachusetts
Ellis Royden Westcott, Jr.	Seekonk, Massachusetts
*Samuel Richardson Westcott, Jr.	Williamstown, Massachusetts
*Donald Francis Whalen	Worcester, Massachusetts
George Edward Whiton	Hingham, Massachusetts
*Ira Francis Wickes, Jr.	Pittsfield, Massachusetts
Gordon Oliver Williams	Sunderland, Massachusetts
*George Prescott Wilson	Arlington, Massachusetts
*Albert Chapman Wood	Leominster, Massachusetts
*Wilfred Playdon Worsman	Franklin, Massachusetts
*Michael George Wrabel	Webster, Massachusetts
*Robert Lee Yokes	Medford, Massachusetts

AS OF THE CLASS OF 1948

*Maurice Leo KowalGrafton, Massachusetts

AS OF THE CLASS OF 1949

*Lawrence Edward GrahamArlington, Massachusetts

*Veterans—World War II.

CLASS OF 1951

	Home Address	Amherst Address
Adams, Stetson Kimball	Leverett	Leverett
Adkins, Robert Moody	Worcester	Commonwealth Circle T-2
Ahern, Edward John, Jr.	Springfield	Commonwealth Circle T-3
Andrews, Richard Carl	Spencer	269 North Pleasant Street
Averka, Charles David	Auburn	Commonwealth Circle S-19
Babacas, Socrates Theologus	Amherst	12 Dickinson Street
Bak, Chester Stanley	Derby, Conn.	41 Cottage Street
Baker, Harold Rene	Holyoke	Mill Valley Road, Belchertown
Baker, William Earl	Belchertown	Belchertown
Ballou, Richard Cecil	Orange	8 Sunset Avenue
Barnicle, Richard Albert	Waltham	24 Dickinson Street
Barrell, Howard Francis	Worcester	Commonwealth Circle T-11
Bates, Richard Baxter, Jr.	Carlisle	8 Sunset Avenue
Beach, Raymond Homer, Jr.	Wilbraham	Wilbraham
Belden, Clifford Luce, Jr.	North Hatfield	North Hatfield
Bishop, Robert Webber	East Wareham	57 Woodside Avenue
Blake, Richard Carter	Wilmington	91 Gray Street
Bradshaw, Robert Clayton	Lexington	20 South Prospect Street
Brown, Richard Forrest	South Hadley	South Hadley
Brown, Richard Nickerson	Billerica	57 Woodside Avenue
Bryer, Donald Ralph	Raynham	Commonwealth Circle R-20
Bulman, John Francis	Dedham	91 Gray Street
Burditt, John Brooks	Wakefield	Commonwealth Circle T-23
Burzynski, Rupert Frank	Springfield	24 Dickinson Street
Buzzee, Wayne	Easthampton	15 Sunset Court
Callahan, Jeremiah Gilbert	Taunton	Commonwealth Circle T-14
Capizzi, Orlando	West Newton	Commonwealth Circle T-21
Carl, Sidney Francis	Hatfield	Hatfield
Carney, Donald Arthur	Worcester	335 Amity Street
Cavallaro, Sebastian	Andover	Commonwealth Circle R-30
Charnas, Leonard Burt	Sharon	Commonwealth Circle S-3
Chesney, Waldron Wheeler	Pittsfield	Commonwealth Circle S-29
Chidsey, Frank Tait	Longmeadow	150 Montague Road, North Amherst
Clough, Byron Bartlett	Worcester	Commonwealth Circle T-21
Collins, William Gregg	Lexington	Commonwealth Circle S-17
Cooper, Harvey Morton	West Barrington, R. I.	303 North Pleasant Street
Cooper, Robert Lee	New Bedford	Commonwealth Circle R-27
Correa, Richard William	Plymouth	Commonwealth Circle R-28
Cox, William Sewall	Wakefield	Commonwealth Circle T-23
Cummings, Charles Bavel	Arlington	10 Tyler Place
Cummings, Frederick Kendall	Woburn	32 Kendrick Place
Cummings, Lewis Everett	Arlington	10 Tyler Place
Cutler, Eleanor Ruth	Wayland	Lewis Hall
Davenport, Russell Maurice	Shelburne	Commonwealth Circle T-2
Davies, William Edward	Arlington	61 Lincoln Avenue
Davis, Harvey Bruce	Franklin	Mt. Pleasant Inn
Davis, Russell Warren	Worcester	Commonwealth Circle Q-10
Day, Charles Packard	Brimfield	East Pleasant Street
Dean, Richard Oliver	Shrewsbury	30 South Prospect Street
DeCosta, Frederick Joseph	South Boston	Commonwealth Circle S-24
DeSelva, Nicholas Paul	Dorchester	367 North Pleasant Street
Desmond, Gerald Meighan	Everett	13 Colony Court
DiGregorio, Rudolph Alphonse	Southbridge	640 Main Street
Dodge, David Langston	Sterling	11 Dickinson Street
Doerpholz, Kenneth Emil	Holyoke	23 Lyn Drive, Granby
Donnellan, Arthur Lindsley, Jr.	South Hadley	Commonwealth Circle T-18
Downing, Paul Joseph	South Weymouth	24 Dickinson Street
Drinkwater, Gerald Joseph	Randolph	640 Main Street
Droz, James Eden	Leominster	Commonwealth Circle S-16
Dzuris, David Leslie	South Hadley	South Hadley
Eames, Raymond Arthur	East Walpole	8 Sunset Avenue
Eaton, Robert Willis	Waltham	24 Dickinson Street
Elliott, Linwood Boyd	Brimfield	Brimfield
Ells, James Ernest	Somerville	13 Colony Court
Ellsworth, Robert Sylvester	Chester	8 Clifton Avenue
Emrich, Albert Joseph	Uxbridge	Mt. Pleasant Inn
Ericson, Carl Sumner	Arlington	13 Colony Court
Ethier, David Harmon	North Middleboro	Commonwealth Circle R-26
Fenton, James Francis, Jr.	Agawam	450 North Pleasant Street
Fenton, John Robert	Northampton	Northampton
Finan, Richard Mansfield	Concord	14 Allen Street
Fisher, Robert, Jr.	Waltham	24 Dickinson Street
Fitzgerald, Edward George	Westfield	Commonwealth Circle S-32
Fitzpatrick, Joseph Henry	Medway	Commonwealth Circle T-28
Flerra, Francis Louis	Acton	Commonwealth Circle Q-11
Fletcher, Melvin Ernest	Marlboro	Commonwealth Circle Q-9
Fredenburgh, Edwin Joseph, Jr.	Concord	Commonwealth Circle R-31
Fritz, Martin Gerard	Greenfield	Greenfield
Fuller, William Perry, Jr.	Foxboro	Commonwealth Circle S-3
Fydenkevez, Thomas David	Amherst	Amherst
Gallant, Richard Pascal	Lawrence	367 North Pleasant Street
Galvin, Francis Joseph	Cambridge	Commonwealth Circle R-5
Gaudette, Warren Conrad	Northampton	Northampton
Gautreau, Marcel Joffre	New Bedford	8 Sunset Avenue
Germond, Bartholomew Joseph	Woburn	800 North Pleasant Street

	Home Address	Amherst Address
Ghelli, Francis Henry	Holliston	12 Colony Court
Gill, Clyde Standish	Lowell	Commonwealth Circle R-16
Girouard, Raymond Denis	Worcester	Commonwealth Circle R-32
Gleason, Roy Alan	Clarksburg	164 Montague Road, No. Amherst
Goldrick, Robert David	Framingham	Commonwealth Circle Q-9
Grayson, Emory Ellsworth, Jr.	Amherst	91 Cottage Street
Greathhead, Warren Benjamin	Lowell	Commonwealth Circle Q-2
Gregory, Robert Francis	East Boston	Commonwealth Circle R-5
Griswold, Frederick Harper	Winsted, Conn.	Commonwealth Circle S-22
Groff, Peter Lambert	Ashley Falls	800 North Pleasant Street
Gustafson, Carl John, Jr.	North Brookfield	Montague
Haas, Henry Walter	West Springfield	Commonwealth Circle T-27
Hahn, Richard William	Lee	Commonwealth Circle T-18
Hall, Philip Herbert	Southwick	Southwick
Hall, Robert Carlton	Williamstown	Commonwealth Circle S-29
Handy, Philip Dustin	Cataumet	11 Dickinson Street
Hanson, James Carl	Framingham	62 Triangle Street
Hart, Hilton Dwight	Blandford	13 Hadley Court
Hartley, Joan Audrey	Middlefield	Lewis Hall
Hartman, Coburn Morrison	Worcester	Commonwealth Circle R-24
Hartnett, Lawrence Edward, Jr.	Woburn	Commonwealth Circle R-20
Hays, Donald Carl	Huntington	Huntington
Healey, Warren Edward	Springfield	Commonwealth Circle R-32
Heath, Edward Herbert	South Deerfield	South Deerfield
Heins, Kenneth William	Fitchburg	Commonwealth Circle T-28
Hendricks, Ernest Albert	Northampton	Northampton
Higham, William Michael	New Bedford	57 Woodside Avenue
Hill, Deane Freckelton	Melrose	Commonwealth Circle S-27
Hilyard, James Douglas	Everett	382 North Pleasant Street
Holden, Paul Russell C.	Hudson	34 Kellogg Avenue
Holmgren, William Olaf	Brookfield	Brookfield
Hooper, Wilford Haynes	Wellesley	86 Gray Street
Horgan, John Leo	Brookline	Commonwealth Circle R-18
Horgan, Walter Edmond	Worcester	472 North Pleasant Street
Houghton, Allan Ralph	New Bedford	29 Church Street, Ware
Hutchinson, William Albert	Worcester	65 Taylor Street
Ibbittson, Loring Curtis	Hanson	Commonwealth Circle S-11
Ineson, Philip George	Stow	30 South Prospect Street
Jamieson, George Andrew	Maynard	65 Taylor Street
Jones, George Robert	East Walpole	Commonwealth Circle S-18
Jordan, Robert Gordon	Whitman	Poultry Plant
Kakitis, Leon Harry	Athol	800 North Pleasant Street
Keavy, Paul Swayze	Hyannis	Drake Hotel
Kelleher, Donald James	Brockton	132 High Street
Kitson, Conrad James	Lexington	R. F. D., Montague
Kivikoski, Paul Leonard	Maynard	Commonwealth Circle R-30
Krawczyk, Edward Stanley	Springfield	Commonwealth Circle Q-2
Kupiec, Henry	Adams	269 North Pleasant Street
Laauwe, Harold William, Jr.	Paterson, New Jersey	17 Gaylord Street
Ladd, Everett William	Dedham	58 Pine Street, No. Amherst
Lagerstrom, George Walter	Needham	417 North Pleasant Street
Lane, Charles Leverett, Jr.	Rockport	Commonwealth Circle T-24
Lane, Robert Edgar	West Springfield	Commonwealth Circle T-27
Langeway, Hosea William	Vergennes, Vermont	Mt. Pleasant Inn
Lariviere, Albert Joseph	Granby	Granby
Larson, Lee James	Townsend	Commonwealth Circle R-26
Lasczyk, Edwin Anthony	Westfield	18 North Prospect Street
Lawrence, Clarence Richard	Winchendon	535 South Pleasant Street
Lawson, William Charles	Newburyport	13 Colony Court
Leach, Albert Ellis, Jr.	Holyoke	Holyoke
Ledoux, Albert Louis	Swansea	Commonwealth Circle R-27
Loftus, Francis Paul	Belchertown	Belchertown
Makela, Betty Ellen	Townsend	Lewis Hall, Room 301
Malinoski, John Stanley	Amherst	268 Sunset Avenue
Maloney, Gerald Michael	Worcester	42 Cottage Street
Martineau, Henry Edwin	South Vernon	15 Hallock Street
Mason, Carlton Shepard, Jr.	Mansfield	289 Triangle Street
Meister, Robert Benjamin	Maynard	Commonwealth Circle R-16
Metcalf, Paul Elmer	East Rochester	57 Woodside Avenue
Metzelaar, Henry Blankert	Boston	35 Chapman Street
Mikonis, Carroll Paul	Haverhill	Commonwealth Circle T-32
Mollins, Richard Terrance	Melrose	314 North Pleasant Street
Moore, George Wilnot	Roxbury	Commonwealth Circle R-17
Morganti, Salvatore	Needham	Commonwealth Circle S-6
Morse, Richard Chester, Jr.	Princeton	12 Colony Court
Mosher, Kenneth Charles	Assonet	Commonwealth Circle Q-3
Murdy, William Henry	Fairhaven	62 Triangle Street
Murphy, Sherman Haynes, Jr.	North Reading	Commonwealth Circle Q-13
McColleston, Donald Quincy	Shirley	Mt. Pleasant Inn
McCrea, Joseph Finlayson	Whitinsville	Commonwealth Circle S-14
MacDonald, Robert Burton	Woronoco	67 McClellan Street
McGiverin, Joseph Edward	Holyoke	Holyoke
McGrath, Harold Francis	Holyoke	Holyoke
MacKenzie, Hugh John	Jamaica Plain	Commonwealth Circle Q-15
MacKenzie, Robert Edmond	Holyoke	Commonwealth Circle T-33
MacMunn, Donald Peter	Marlboro	108 High Street
Neal, Alton Hall	Northampton	Northampton

Home Address

Amherst Address

Norris, Burnell Chauncey, Jr.	Groton, Vermont	101 Blue Hills Road
Nugent, Francis Xavier	Clinton	Commonwealth Circle T-33
O'Doherty, John Leo	Winchester	24 Dickinson Street
O'Neil, John Joseph	Northampton	Northampton
Ormsbee, John Brewster	New Marlboro	8 Sunset Avenue
O'Sullivan, William Bartholomew	South Boston	Commonwealth Circle S-24
Park, William Hamblen, Jr.	Fayetteville	Commonwealth Circle S-11
Parsons, Edward Josiah	Northampton	Northampton
Pease, Howard Francis, Jr.	Middlefield	Commonwealth Circle S-25
Pellegrini, Armand Rocco	Winthrop	Commonwealth Circle Q-6
Pellegrino, Daniel James	Newton	Commonwealth Circle S-6
Pennock, Thomas Wood	Springfield	Springfield
Perry, David Arthur	Attleboro	24 Dickinson Street
Phillips, Arthur Peter	Great Barrington	12 Colony Court
Pihl, Roger Arthur	Chelmsford	Commonwealth Circle R-18
Plourde, Valmore Alfred	Chicopee Falls	Chicopee Falls
Pollard, Herbert Lee	New Braintree	Commonwealth Circle S-14
Powell, Edward Burgess	Belmont	Commonwealth Circle S-16
Read, Robert Warren	Holliston	West Street
Reed, Everett John	Holyoke	39 Paige Street
Reid, Clifford Frank	Deerfield	Deerfield
Richardson, David Webster	Easthampton	Easthampton
Richter, Henry Andrew	Lancaster	24 Dickinson Street
Robbins, Trueman LeBaron	Arlington	Commonwealth Circle S-8
Rogers, Paul Edward	Medford	12 Colony Court
Rolfe, Joseph Davis, Jr.	Newbury	Commonwealth Circle Q-13
Rose, John Richard	Lenox	Commonwealth Circle S-12
Rosenthal, Arthur Nathaniel	Orange, New Jersey	Commonwealth Circle R-28
Roy, Jean-Paul Alphonse	North Adams	2575 Boston Road, Wilbraham
Ryder, Floyd Edwin	Orange	Commonwealth Circle S-17
Scaringi, John Herbert	BillERICA	13 Hadley Court
Schoales, Gilbert Clifton	Leominster	10 Tyler Place
Schultz, Herman Charles	Bolton	South Amherst
Selmer, Lorraine	Dedham	Adams Hall
Shafraan, Jacob	Brighton	Commonwealth Circle R-17
Sharp, Gordon Ellery	Worcester	335 Amity Street
Shellnutt, John Hamilton	North Andover	Commonwealth Circle T-32
Sherman, Milton Rogers	Chatham	58 Pine Street, No. Amherst
Sherman, Philip Duane	Hyannis	367 No. Pleasant Street
Sibley, Gloria May	Winchendon	Thatcher Hall
Smith, David Emerson	Walpole	Commonwealth Circle S-18
Smith, John Robert	Waltham	30 Harris Street, No. Amherst
Smith, Robert Alwood	Belchertown	Belchertown
Smith, Robert Richard	Lexington	Commonwealth Circle R-4
Somes, Ralph Gilmore, Jr.	Melrose	Commonwealth Circle R-10
Spencer, Everett Francis	Whitinsville	Commonwealth Circle S-27
Stedman, Robert Parfitt	Amherst	South East Street
Stephens, Gerald Henry	Dalton	Commonwealth Circle S-25
Stevens, Allen Frederick	Lexington	Commonwealth Circle Q-4
Stewart, James Boyd	Turners Falls	Turners Falls
Stowell, Thomas Edwin, Jr.	Pittsfield	288 Pine Street, Holyoke
Stroberg, Eric Herbert	Melrose	Mt. Pleasant Inn
Sullivan, Frederic Arthur	Belmont	Commonwealth Circle Q-14
Sullivan, George Thomas	Watertown	Commonwealth Circle Q-4
Swift, Beverly Almira	Attleboro	Thatcher Hall
Tanner, Howard Albert	Clarksburg	164 Montague Road, No. Amherst
Timson, Floyd Goodnow	South Vernon	South Vernon
Tooley, Norman Carl	Pittsfield	Commonwealth Circle R-15
Tracy, Cornelius John	Millbrook, New York	Mt. Pleasant Inn
Trenholm, Richard MacLean	Arlington	10 Tyler Place
Van Iderstine, Robert Everett	Arlington	Commonwealth Circle R-15
Velander, Henry Victor	Turners Falls	Turners Falls
Vuilleumier, Robert Gage	Cochituate	32 Kendrick Place
Waidlich, Henry	Millers Falls	Millers Falls
Warner, Albert Austin, Jr.	Springfield	Alpha Gamma Rho
Watson, George Bailey	Medford	336 North Pleasant Street
Wellington, Paul Edward	Waltham	108 High Street
Wells, Robert Stephen	Melrose	335 Amity Street
Wender, Stanley Peter	Springfield	Springfield
Wendolowski, Bernard Stanley	Hatfield	Hatfield
Wentworth, Richard Allan	Amherst	South East Street
Wheeler, Everett Russell	Auburn	41 Phillips Street
Whelan, Philip John	Boston	17 Gaylord Street
White, Robert William	Northampton	Northampton
Widemer, Paul	Hadley	Hadley
Wiggins, Robert William	Arlington	13 Colony Court
Wolinski, Burton Ralph	Winthrop	13 Colony Court
Woodbury, David Elwell	Newton Highlands	Commonwealth Circle Q-11
Woods, William Barton	Beverly	Commonwealth Circle S-22
Wright, Frank Paul	Arlington	Commonwealth Circle S-19
Wright, James Pickford	Westfield	472 North Pleasant Street
Wyman, Robert Duncan	Rockland	34 Kellogg Avenue
Young, Willard Henry, Jr.	Belchertown	Belchertown

"God grants liberty to those who love it, who are always ready to guard and defend it."

"The cultivation of the earth is the most important labor of man. Unstable is the future of the country which has lost its taste for agriculture. If there is one lesson of history that is unmistakable, it is that national strength lies very near the soil."

—DANIEL WEBSTER.

Born in Salisbury, New Hampshire, 1782-1852. His father a farmer of Scottish stock. Graduated from Dartmouth College in 1801. In 1820 he aided greatly in revising the constitution of Massachusetts. Became one of the greatest orators in the nation. Lived and died in Marshfield, Massachusetts.

FARM and HOME DAYS

JULY 20-21, 1950

University of Massachusetts



Skinner Hall—Information Desk

Bulletin

VOL. XLII

JULY, 1950

NUMBER 7

PUBLISHED SEVEN TIMES A YEAR BY THE UNIVERSITY OF MASSACHUSETTS
JANUARY, FEBRUARY, MARCH, APRIL, MAY, JUNE, JULY
ENTERED AT THE POST OFFICE, AMHERST, MASS. AS SECOND CLASS MATTER

General Information

INFORMATION DESK

An information desk will be located in Skinner Hall, where telephone messages and mail for visitors will be received from 9:00 a.m. to 8:00 p.m. Telephone number is Amherst 900.

ROOMS

Dormitory rooms are available July 19-20-21 at Hamlin House (on Route 116) at \$1.50 per night. Linen will be furnished. No maid service. Bring your own soap and towels. Reservations should be made in advance by writing to Miss Eleanor Dwyer, Agricultural Economics Department, University of Massachusetts, Amherst. Room information and assignments can be secured at Hamlin House after 1 p.m., Wednesday, July 19.

Rooms are also available in private homes at an average price of \$2 per night. Hotel rooms in Amherst average \$3 to \$4.50 per person.

MEALS

The University cafeteria will serve meals (G.I. style) during Farm and Home Days as follows:

Morning	8:00 to 8:30
Noon	11:30 to 12:45
Evening	5:30 to 6:15

The University Store, North College, will be open from 8:30 a.m. to 4:45 p.m.

Thursday, July 20

Fruit

* ORCHARDS NEAR COLD STORAGE

10:00 A.M. Exhibits and Orchard Demonstrations of the Leading Makes of Concentrate Sprayers.

12:00 Lunch—Draper Hall

* RHODODENDRON GARDEN

1:30 P.M. "The Use of Mist Concentrates for the Control of Orchard Pests" — Dr. J. L. Brann, Jr., Cornell University.

2:30 *Continuation of Orchard Demonstrations of Concentrate Sprayers.

* *In case of rain, the program will be held in the Physical Education Cage.*

PUBLICATION OF THIS DOCUMENT APPROVED BY GEORGE J. CRONIN, STATE PURCHASING AGENT
8M-7-50

Please Bring This Program With You July 20-21

THURSDAY—CONTINUED

Homemaking

SKINNER AUDITORIUM

Beatrice E. Billings, State Home Demonstration Leader
U. of M., Presiding

(Lecture Demonstrations)

- 10:00 A.M. "Let There Be Light"—Miss Lillian Eddy, Home Lighting Specialist, General Electric Co., New York City.
- 11:00 "Reading for Instruction, for Information, and for Pleasure"—Mr. John L. Fitzpatrick, Superintendent of Schools, Chicopee.
- 11:00 "New Products for the Home"—(Skinner, Room 4)
Miss Irma Winkleblack, Home Economist, United States Rubber Co.
- 12:00 Lunch—Draper Hall

BOWKER AUDITORIUM

Dr. Helen S. Mitchell, Dean, School of Home Economics
U. of M., Presiding

- 1:00 P.M. Music and Movies.
- 1:30 Panel Discussion—"Community Responsibility for Adolescent Youth"
Chairman—Dr. Libbie Bower, Consultant, School Project, Mass. Society for Mental Hygiene.

Miss Marendra Prentis, Executive Sec'y.
Mass. Conference of Social Work

Rev. James H. Laird
Wesley Methodist Church, Amherst

Mr. Robert S. Savitt
Principal, Amherst Junior High School

Mrs. L. A. Merritt—a parent,
Williamsburg, Mass.
- 3:00 "Our Stake in United Nations"—Mrs. Louise L. Wright, Director of Chicago Council of Foreign Relations.
- 4:00 Punch served on lawn.

THURSDAY—CONTINUED

Forestry

1:00 P.M. *Field trip to University Forest on Mount Tobey. Staff of Forestry Department in charge. Meet in automobiles at Conservation Building.

Trip will show various forest operations carried out over a number of years. Includes thinning, weeding, pruning, other cultivation. Of special interest will be a one-cord charcoal kiln and demonstration of preservation of fence posts and farm timbers against decay and termites.

* *In case of rain, group will meet in Conservation Building where illustrated talks on Mount Tobey and other forest activities will be given.*

Dairy Goat

FARLEY CLUB HOUSE

10:00 A.M. Business Meeting of Massachusetts Council of Milk Goat Breeders' Associations.

President, Warren Ernst, Harvard, Presiding.

11:00 "The Future of Dairy Goats in America"
Allen Rogers, Silver Springs, Md.

12:15 P.M. Lunch—Draper Hall

1:30 "Dairy Goat Management"
Robert Reinhardt, Waukesha, Wis.

2:30 Panel Discussion—"Choosing A Dairy Goat Breed".

Special Program

THURSDAY NIGHT

BOWKER AUDITORIUM, 7:30. P.M.

General Session including inspirational speaker, music,
and outstanding entertainment

Please Bring This Program With You July 20-21

Friday, July 21

Homemaking

SKINNER AUDITORIUM

**Dr. Anne Wertz, School of Home Economics, U. of M.,
Presiding**

- 9:30 A.M. "Colorful Paint Adds Character To The Home"
(Lecture Demonstration)
Charles B. Moore, Educational Director,
Devoe and Reynolds, New York City.
- 10:30 "Your Will And Your Family"
Paul Sargent, Attorney-At-Law, Boston
- 12:00 **Lunch—Draper Hall**
- 2:00 P.M. **See HOME GARDEN program**
- 4:00–6:30 **State Home Demonstration Council Meeting**
Mrs. Alton Boan, Westport, Presiding

Home Garden

MEMORIAL HALL

**Clark L. Thayer, Acting Dean, School of Horticulture
U. of M., Presiding**

- 9:30 A.M. "Bringing the Garden Into the Home"
Robert E. Bertram, Salem
- 10:30 "Roses in the Home Garden"
(Illustrated with Kodachromes)
Everett A. Piester, Curator, Elizabeth Park Rose
Garden, Hartford, Conn.
- 11:45 **Lunch—Draper Hall**

SKINNER AUDITORIUM

**Alfred W. Boicourt, Extension Specialist in Horticulture,
U. of M., Presiding**

- 2:00 P.M. "Flower Arrangements for the Home"
(Lecture Demonstration)
Mrs. Winifred Teele, Lecturer and Instructor in
Flower Arrangement, Cambridge.

FRIDAY—CONTINUED

Fruit

* ORCHARDS NEAR COLD STORAGE

10:00 A.M. Small Group Tours of Experimental Orchards. The high points of these tours will include: Chemical Thinning, New Rootstocks, Nursery Identification of Varieties, Chemical Weed Control, Contoured Peach Site, and Spray Tests of New Insecticides.

12:00 Lunch—Draper Hall

* RHODODENDRON GARDEN

G. Stacy Gay, Three Rivers, President of Massachusetts Fruit Growers Association, Presiding.

1:30 P.M. "The Influence of Harvesting and Storage Practices on the Market-life of Apples"

Dr. F. W. Southwick, Research Professor, U. of M.

2:15 Grower Panel on "Handling Procedures from Tree to Storage"

Leader, O. C. Roberts, Professor of Pomology, U. of M.

3:00 "Are Your Distribution Costs High Enough?"

F. E. Cole, Extension Specialist in Fruit and Vegetable Marketing, U. of M.

3:30 Report on the Size of the Apple Crop

Walter E. Piper, Division of Markets, Massachusetts Department of Agriculture.

** In case of rain, the program will be held in Goessmann Auditorium.*

Beekeeping

BOWDITCH LODGE

9:45 A.M. Registration.*

10:00 "Management for Honey Production"

Dr. W. L. Coggshall, Extension Specialist in Beekeeping, Cornell University.

11:00 "What Are We Doing to Reduce Bee Losses Through Poisoning?"—Dr. E. H. Wheeler, Extension Entomologist, U. of M.

11:30 "Fall Management and Wintering of Bees"

Dr. W. E. Dunham, Research Professor, Ohio State University.

12:30 P.M. Lunch—Draper Hall

Please Bring This Program With You July 20-21

FRIDAY—CONTINUED

- 1:30 Business Meeting of Massachusetts Federation of Beekeepers' Associations
President Leonard Rice, Greenfield, Presiding.
- 2:00 "Beeswax, It's Production and Rendering"
Dr. W. L. Coggshall
- 3:00 "Two Queen Systems for Honey Production"
Dr. W. E. Dunham

** Come early, our speakers will be available for discussion by 9:30 a.m.*

5th ANNUAL COUNTRY DANCE FESTIVAL

Alumni Field

Friday, July 21

8:00 P. M.

"AMERICAN FOLK DANCING IN THE FINEST TRADITION"

Featuring the Outstanding
Callers and Dance Teams of New England

ADMISSION 50 CENTS, *Tax Included*

Departments Open For Inspection

1. **SKINNER HALL**—open 8:30 a.m. to 4:30 p.m. Special exhibits of interest to all persons. Ask for list at Information Desk.
2. **FRENCH HALL GREEN HOUSE**—open 8:00 a.m. to 5:00 p.m.
3. **FLINT LABORATORY**—open 9:30 to 11:30 a.m. and 2:00 to 4:00 p.m. Equipment used in the commercial dairy plant for the manufacture of pasteurized milk, ice cream, butter, and cheese can be seen. Also testing equipment for the analysis of milk.
4. **COLLEGE BARN**S—open during daylight hours. Seven breeds of cattle, two of sheep, two of horses, and one of swine are kept.
5. **GOODELL LIBRARY**—open 8:30 a.m. to 5:00 p.m. For browsing and reading. Daily newspapers and over 300 magazines are available. Building houses over 100,000 books.
6. **POULTRY FARM**—rear of Stockbridge Hall. Many young pullets will be in the laying houses. Five breeds are being maintained at the present time. Experimental turkey flock. This farm is used primarily for teaching purposes. Facilities include killing, egg, incubator rooms.
7. **PUBLICATIONS**—entry E. South College—open 9:00 a.m. to 11:30 a.m. and 1:00 p.m. to 4:30 p.m. The Extension Service has over 600 different publications for distribution on agriculture and home economics subjects. Inquire for list.

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